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CHANGES IN THE REFRACTION OF THE EYE

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DENVER

The early impression as to refractive errors was that they were individual peculiarities not subject to important change throughout life. It has long been established that such changes do occur, and it is desirable to learn as much as possible about their dependence upon such factors as age, anatomic variation, use of the eyes, and general health. Analysis is here given of 729 cases in which the refractive condition was tested for a period of ten years or longer. The statistics are classified with regard to increase and decrease of spheric refraction, increase and decrease of total astigmatism, and variations in astigmatic axis. Illustrative cases show the importance to the patient of recognizing that such changes should be looked for and appropriately corrected from time to time. This paper contains the substance of an address delivered before the American Academy of Ophthalmology and Otolaryngology, October 15 to 19, 1928.

The examples of defective ocular refraction first noticed were of high degree, were considered very exceptional, were generally known to have existed for years, if not throughout life, were not fully understood or accurately measured, so that changes of a moderate amount would be overlooked. There naturally grew up an impression that such defects were individual peculiarities. They were thought of as rare anomalies, and were supposed not to undergo essential change throughout life. Each had its peculiarities, that did not change during the brief period for which they were observed.

Even the understanding of accommodation did not reveal the changes that occur in refraction of the eye. The defects of accommodation were confused with myopia. The fact that hyperopia might be concealed by accommodation was held to account for increase of hyperopia in later life.

The belief in the permanence of errors of refraction was easily maintained, in the face of evidence to the contrary. If a patient came wearing lenses that obviously did not correct his ametropia the easy explanation was that they had been given after an inaccurate measurement. If the prescriber did not use cyclopegics, and the critic believed them necessary, there was sufficient reason to ascribe the inaccurate correction to faulty diagnosis. If glasses were prescribed after cycloplegia, and the critic did not believe in the measurement of refraction "under the influence of drugs", the discrepancy was again an evidence of faulty diagnosis. Partisanship hid the scientific facts, and the debate as to whether it was better to use cycloplegics or not went merrily on.

There has been such diversity of methods in measuring refraction, from the exposure of stock lenses and letting the customer choose what he liked, to sitting the patient down before an ophthalmometer and reasoning out what lenses he ought to need; and patients have tolerated such imperfect corrections of their ametropia that data with regard to changes in the refraction, of a kind to inspire confidence in their accuracy, have been scanty. Even when the same methods of measurement have been employed and by the same observer, he has not always felt confidence in the accuracy of his earlier findings when a later testing showed a different result.

A glance at the history of our knowledge of errors of refraction will help understand the subject before us. Nero, watching the combats of the gladiators through his emerald, was pretty certainly a case of myopia corrected by a concave lens. The suggestion of a Roman writer that all emeralds of that shape should be reserved for such use seems to indicate an understanding of its importance. But, after that, little more seems to have been known about myopia until in 1601 it was studied by Kepler, who was himself myopic. His investigations were thought by Donders to have laid the foundation of physiologic optics.

Presbyopia and its correction by convex lenses were fairly understood and widely utilized from the time of the introduction of spectacles in the thirteenth century. But hyperopia was not recognized until much later. The scattered observations of it attached little importance to the defect. Its significance was better understood by Reute, who in 1853 described it under the name "oversightedness". Two years later Stellwag von Carion called it hyperpresbyopia, a name rather widely adopted until Donders described it in 1860, and again more fully in 1864 in his "Accommodation and refraction of the eye".

In 1793 Thomas Young found in his own eyes what he called "normal" astigmatism. That astigmatism might be a cause of serious impairment of vision was first pointed out by Sir Charles B. Airy, professor of mathematics in Cambridge university, in 1827. He had compound myopic astigmatism requiring for its correction a concave cylinder of about eight inches focus, axis 145 degrees. An optician named Fuller ground for him a compound cylindrical lens with which he could read the finest print.

In 1843 Dr. Isaac Hayes of Philadelphia published in the American edition of Lawrence's "Treatise on diseases of the eye" an account, prepared by a patient, a clergyman of Central New York, regarding the latter's own eyes, from which account McAllister of Philadelphia, an optician, had prepared cylindrical lenses which "much improved vision". In 1848 Dr. Goode, who studied at Cambridge, reported his own astigmatism of about three diopters, and further stated that there were three other gentlemen at Cambridge who had a similar defect.

In 1849 Stokes, who had followed Airy as professor of mathematics, described the Stokes lens for the diagnosis of this defect for which Whewell had already proposed the name astigmatism. In 1859 Knapp wrote on the curvature of the cornea. But it was the work of Donders, culminating in 1864 in his "Accommodation and refraction of the eye", that established the importance of astigmatism.

It had to be established that myopia, hyperopia, and astigmatism existed apart from accommodation and presbyopia, and were common and important enough to be worthy of general study on the part of the medical profession, before they could be widely enough and long enough studied to determine that they did change, what these changes commonly were, and what was their practical importance. They have now been studied in enough eyes, by enough observers, and over long enough periods of time to make the recording and discussion of our observations interesting, profitable, and of practical importance to our patients and to ourselves.

Now we know that such changes occur, and that they are important enough to demand attention, it follows that their exact nature, location, causes, rate of progress and continuance; and their relation to age, to use of eyes, to ocular disease, and to general health and nutrition, are all to be inquired into. With our present knowledge and lack of knowledge, a clinical and statistical study of the writer's own experience may be helpful in suggesting lines along which future studies may be carried on.

My case records include 729 cases seen in private practice, in which the

state of refraction was tested over a period of ten years or longer. These have been arranged, according to the age at which the ocular refraction was first measured, in four groups: A before twenty years of age; B between twenty and forty; C between forty and sixty; and D over sixty years of age. In each of these groups the different forms of ametropia were segregated, as myopia, hyperopia, and regular astigmatism.

A few cases illustrating some of the most striking changes can be mentioned in detail; and some conclusions as to general tendencies of change, and probable mechanism of the changes, are suggested. Only cases are included that have been studied in the last twenty years. In this way a certain uniformity of technique was secured, such as laboratory workers have found to exclude many errors that are likely to creep in when the observations of various workers, or measurements by different methods, are compared. The age groups are first considered, and later the different forms of ametropia and kinds of change encountered.

In the period before twenty years of age the cases of high ametropia of congenital origin are prominent. But such cases were found in all the later groups. In general, a great overlapping of age periods is apparent in these groups. Among the 123 first seen before twenty years were 98 who were followed after the age of forty. Among 356 first seen between twenty and forty years were 310 seen after the age of forty and ten examined after sixty years. Of the 241 first measured between the ages of forty and sixty years, 119 were also seen after they were sixty. From such an incomplete and confused analysis of the cases studied, it is not possible to bring into sufficient relief many of the facts with regard to changes in ocular refraction. But if we can learn that they occur, and what is their general frequency at different parts of life, as well as their practical importance, particularly in later life, the time will not have been wasted.

Age groups

The cases first seen before twenty years of age include some in which the ametropia was probably congenital. But, as the patients when first seen were none of them less than two years old, the decision as to whether the error of refraction existed from birth or had developed subsequently could only be decided, with probable correctness, upon collateral evidence. The same sort of evidence would be available with regard to such cases seen later in life. It is rather outside our subject to discuss them here; and the number that probably belong in this class is too small to furnish a basis for a statistical study. The impression made by going over the series of cases is that such cases probably are less likely to change than cases in which ametropia has developed after birth, except the cases in which the ametropia is associated with partial or complete luxation of the lens.

The relations of the crystalline lens with its capsule and with the ciliary body are known to develop in later fetal life, and are supposed to determine to some extent the refraction of the eye. It has been supposed that tendencies of prenatal development, carried over into infancy, might influence changes in the refraction during infancy. It is well known that almost all eyes are hyperopic at birth, that some become less so during childhood, and that some pass over into myopia. Is any general tendency in this direction indicated by these statistics? In group A, the ages when the refraction was first measured varied from two to twenty years, the average being nine years. When last measured the ages varied from 13 to 39 years, averaging 26 years. It should be noticed that the average age at which the hyperopes were first examined was eight years, while the myopes were first seen at the average age of thirteen years. This points to myopia as a notable defect

appearing after the children had been subjected to the unfavorable conditions of school life.

Summary of statistics

In summing up the change in refraction found in this series of cases, it was set down as "no change" when the record showed a change of 0.25 D. or less. When the change was more than 0.25 D. but less than 1 D., it was set down as "slight". When it was 1 D. or more than 1 D., it was counted as a change in refraction. Among the 123 cases first examined before 20 years of age, there were 34 cases of myopia. Of these, 3 showed no change of amount, 7 slight increase, and 12 an increase of 1 D. or more. There were 7 that showed slight decrease, and 2 a decrease of 1 D. or more. Among 89 cases of hyperopia, 25 showed no change of amount, 31 slight decrease, and 7 a decrease of 1 D. or more. There were 20 that showed a slight increase of hyperopia, and 9 an increase of 1 D. or more. That is, among the 123 cases, there were 28 which showed no change of refraction, 38 a slight increase, and 19 a decided increase, higher myopia or lower hyperopia. But there were also 9 that showed decreased myopia, 7 slight, and 2 over 1 D., and 29 that showed increased hyperopia, 20 slight and 9 of 1 D. or more. Thus, among the 123 cases 38 cases, or 31 percent, showed increasing refraction; and 38 cases, or 31 percent, decreasing refraction.

As to changes in astigmatism, 38 showed no change in the amount. It increased in 62, slightly in 45 and decidedly in 17. It decreased in 14, slightly in 9 and decidedly in 5. As to changes in the direction of the principal meridians, changes of ten degrees or less were noted as "no change". This was the condition in 46 cases. But in 35 cases or 28 percent there was a change of more than ten degrees. In 8 cases, or 7 percent, the meridian of greatest curvature shifted toward the vertical (astigmatism with the rule, direct astigmatism); and in 27 cases, or 23.5 percent, it shifted from the vertical (against the rule, inverse astigmatism).

These details have been dwelt upon to illustrate the method of this statistical study. Its main results in the other groups, B from 20 to 40 years, C from 40 to 60 years, and D over 60 years, can be stated more briefly in tabular form for easy comparison.

Changes in refraction in 729 patients

	Age group			
Spheric refraction	A	B	C	D
Total cases	123	356	214	36
No change	28	34	24	4
Increased myopia	19	49	25	3
Decreased myopia	9	36	18	1
Decreased hyperopia	38	90	71	18
Increased hyperopia	29	154	79	9
Increased refraction	57	139	104	21
Decreased refraction	38	190	97	10
Astigmatism				
Total cases	114	338	202	35
Increase	62	154	105	15
Decrease	9	90	43	13
No change of axis	38	94	44	1
From 90°	27	198	148	32
Toward 90°	8	9	3	2

The cases of no change in spheric refraction generally showed changes in astigmatism. Those showing no change of axis showed change in amount of astigmatism, or of spheric refraction. Of the 729 cases only three showed no change of any kind, and only six showed as little as 0.50 D. change in amount, or ten degrees in the axis of the cylinder.

In the statistics of a large number of cases, observed over such a term of years, the figures summarizing those observations bring out the general tendencies in the changes of ocular refraction. Changes of certain kinds and forms will need to be worked up in special studies. The important changes that bring about

myopia and keep it progressive, and the changes that make it regressive, are of such special character. They have been recently considered in a paper not yet published. It has been well known that myopia arises in early life, and the influence of its beginning is apparent in group A, first examined before the age of twenty years; but the influence of age on the spheric refraction of the eye may be a general influence, and must be noticed here.

It is significant that in group A there were just 31 percent that showed increase of refraction in the form of increasing myopia or decreasing hyperopia, and 31 percent that showed decrease of refraction, in the form of increasing hyperopia or decreasing myopia; while in 38 percent no notable change in refraction occurred.

In group B there were 356 cases, of which only 34 showed no change and 110 showed change of less than 1 D. In the whole group there were 139, or 39 per cent, that showed increase, and 190, or 53 per cent, that showed decrease of refraction. This is a larger percentage of change and a much larger percentage of diminished refraction and increased hyperopia.

In group C, those first seen between forty and sixty years, the change in these percentages is still more notable. Among the 214 cases there were 96 cases, or 45 percent, of increased and 97 cases, or 45 percent, of diminished refraction, while less than 10 percent showed no change.

In group D, those first seen after sixty years, there were only five who did not change in spheric refraction, which increased in 21 cases and decreased in only 10, or respective percentages of 58 and 28. Comparison of these groups shows an increasing tendency to change in refraction in the direction of increased hyperopia; but after fifty years an increasing number in whom the hyperopia is decreased, or myopia increased, the "second sight" of age, which has long been known both in medical literature and in popular tradition.

With reference to regular astigmatism these statistics reveal still more striking and important changes. In Group A, 114 patients under twenty years, astigmatism increased in amount, slightly in 45, and decidedly in 17, a total of 62. It decreased in 14, slightly in 9, and decidedly in 5. Before 20 years, there are changes in amount of astigmatism, generally in the direction of increase. In group B, 356 patients, there were 130 whose astigmatism increased slightly and 24 decidedly, altogether 154 with increase. There were 90 cases of decrease, 12 decided (1 D. or more) and 78 slight (less than 1 D.). From twenty to forty years the tendency to increase of astigmatism continues but is less preponderant. From forty to sixty years, out of 202 cases, the amount of astigmatism increased slightly in 81 and decidedly in 24, a total of 105; while it decreased in 43, decidedly in 5 and slightly in 38. In 36 patients first seen after sixty years of age, the astigmatism increased in amount in 20 and decreased in 16. At all ages the amount of regular astigmatism is liable to change, although in the majority of cases such changes are relatively slight.

The most striking changes in refraction are the changes in direction of the principal meridians of astigmatism. These changes are not merely apparent, from inaccurate determination of the principal meridians, although they are liable to be overlooked on that account; and they increase in number and importance with advancing age. At all ages the tendency of the change in the meridian is for the meridian of greatest refraction (axis of the convex cylinder) to shift from the vertical (from what has been called "astigmatism with the rule") toward the horizontal; which, although long called "astigmatism against the rule", is the more common form in advanced age. This change in astigmatism has gradually become more widely appreciated by ophthalmologists in the last thirty

years; but the full force and importance of it had not impressed me until I studied these statistics.

In preparing these statistics, no cases were counted as having a change of meridian unless the change was over ten degrees. Among 35 cases in group A, first seen before twenty years, the meridian of greatest refraction had shifted toward 90° in 8, or 23 percent. It had shifted from 90° in 23, or 77 percent of those in whom a change was counted. Among the 207 cases of group B, between twenty and forty years, the meridians of greatest refraction had shifted toward 90° in 9, and from 90° in 198, or 4 percent and 96 percent respectively. In group C, 214 cases between forty and sixty years, the meridian had not shifted more than 10 degrees in 44 cases, it had shifted toward 90° in 3 cases, and from 90° in 148, or respective percentages of 2 and 98 among those that shifted. The group of 36 patients seen after sixty years showed almost wholly the results of such changes, rather than actual changes during the concluding years of life.

The exact anatomic changes in the eye which produce these changes in refraction are still a subject for special study; although a few references regarding them may be helpful in pointing the way for further investigations. In childhood, youth, and early adult life, there is some indication that the change is one of increased anteroposterior axis. This is certainly true for acquired and progressive myopia, but does not receive much support from statistics of hyperopia. As to the changes that occur in later life, the ophthalmometric studies of the cornea very rarely show changes in its curvatures, and the changes of astigmatism cannot be of axial origin. We are forced to believe that these changes are chiefly, almost wholly, lenticular.

Since Priestley Smith observed the increased size of the normal crystalline lens from twenty-five to sixty-five years of age, and suggested that this was probably the cause of the increasing hyperopia of later life, no more probable hypothesis has been offered. The present statistics show that the changes in shape of the crystalline lens must be studied anew, with new exactness and by new methods. Such studies will greatly increase our knowledge of its physiologic and pathologic alterations. It is too large a subject to be discussed in this paper.

Illustrative cases

A few outlines of cases, the more recent or striking among hundreds of similar cases, may illustrate the enormous practical importance of these common changes in refraction.

A boy of fifteen years was wearing glasses for myopia, R.—3.50 sph., L.—3.75 sph. These had been changed repeatedly, and the vision continued to grow worse. He came because it was now reduced to 0.7. His correction, R.—2.87 sph.—1.25 cyl. axis 95° L.—2.50 sph.—0.75 cyl. axis 85°, gave vision of 1.2, and it seems to have stopped the progress of myopia.

A woman of forty-seven years required—1. sph.—1.25 cyl. axis 5°, L. —1.25 sph.—1. cyl. axis 5°, and 2.50 sph. added for near. After four changes of glasses she now requires R.—5.50 sph., L.—2.25 sph.—1.75 cyl. axis 23°. Lens opacities have been visible for twelve years, but with vision of 0.6 the eyes are equal to the reasonable demands made upon them.

A lawyer aged fifty-nine years had had glasses sixteen years before from a careful oculist who said that for distance they would not need to be changed again. The deficiencies on account of presbyopia had been made good by opticians until 3.25 sph. had been added for that purpose. Correction of the hyperopic astigmatism gave relief from headache, stiff neck, and other nervous symptoms complained of.

A business man of seventy-three years had obtained glasses from an optometrist for 20 years. These had

been frequently changed and he now wore R.—0.75 sph., L.—0.50 sph, with +2. sph. added for near. He went back to have them changed, and was told by the optometrists that they could do nothing more for his eyes in the way of glasses. His new correcting glasses, R.—0.75 cyl. axis 87°, L. + 0.50 sph.—1. cyl. axis 95°, gave him vision of 1.2 in each eye; and with 2.75 added for near his eyes seemed and felt as good as ever.

A woman had come to me first at the age of forty-three years. At the age of seventy-five years she returned wearing the glasses I had given her ten years before. Her eyes felt weak when she read in the evening, and she thought it was time to have her glasses changed. Her vision was then 0.7. The distance correction required 0.75 more sphere and 0.50 and 0.25 more cylinder. With these, and with 2.75 added for near, she can read freely. After first putting on the new glasses and walking a few blocks to show them to me, she had already noticed that her eyes felt rested by them.

Oculists have been disposed to admit that opticians or optometrists might be allowed to give glasses to presbyopes. Experience shows that to abandon these patients, when diminished accommodation makes slight errors of refraction and inaccuracies of correction still more important, is a shirking of responsibility that might be overlooked in men whose primary object is to sell glasses, but can not be ignored in those who claim fitness for the practice of a learned profession.

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SOME CLINICAL OBSERVATIONS ON LEVOGLAUCOSAN (LINKS-GLAUKOSAN) AND AMIN-GLAUCOSAN.

E. C. Ellett, M.D., F.A.C.S., and R. O. Rychener, M.D.
MEMPHIS

Case histories are given to illustrate the effect of levoglaucosan (Linksglaukosan) in simple glaucoma; of amin-glaucosan in acute glaucoma; and of levoglaucosan in acute iritis with posterior synechiæ, and in iris adhesions accompanying injuries. In five cases of simple glaucoma levoglaucosan lowered the tension transitorily, five cases were unaffected, one was permanently improved, but in no case was the tension permanently lowered by the use of glaucosan alone. Amin-glaucosan failed to reduce the tension in six cases of acute glaucoma. Levoglaucosan was valuable in breaking fresh iris adhesions in acute iritis or uveitis, was of no value in separating old iris adhesions, and did not break up adhesions directly associated with injuries.

In 1922, Carl Hamburger[1] advocated the use of adrenalin or suprarenin in the treatment of simple glaucoma, later developing the drug called glaucosan. This is a combination of dextrorotatory suprarenin, or ordinary suprarenin, and methylaminoacetopyrocatechol, a polariscopically neutral by-product in the synthetic manufacture of suprarenin. This was intended for subconjunctival injection.

Continuing his researches, he developed a synthetic levorotatory tartaric acid alkaloid derived from the suprarenal capsule, which he called "Linksglaukosan" (levoglaucosan). This, used in two per cent strength and combined with methylaminoacetopyrocatechol in the same strength, proved to be active enough to use by instillation only. It causes a dilatation of the pupil and a decrease in intraocular tension. This is the preparation we have used and is what we mean by "glaucosan". It comes in sterile glass ampoules in two per cent solution and in the combination referred to, ready for use.

Hamburger also described an amin derivative of ergot called amin-glaucosan (imidazolylethylamin hydrochloride) which is supposed to be a powerful miotic, and when used in acute glaucoma is said to cause contraction of the pupil and a decrease in tension.

The method of instillation of levoglaucosan is simple. The eye is anesthetized with holocain or butyn, and then, with the patient in a recumbent position, two drops of the solution as furnished in the ampoules are instilled in the cul-de-sac. While the lids are held open, the patient is directed to rotate his globe in the four cardinal directions, which allows the drug to come into free contact with the globe. The drops are repeated from three to five times at intervals of fifteen minutes. In a few moments after the first drop, the eye should become porcelain white, the lid aperture widen, and the pupil dilate quite regularly, while a zone of ischemia usually develops on the lids, cheek, and temple. Practically always there is a distinct drop in tension.

1. Levoglaucosan in simple glaucoma

Hamburger[2] feels that every case of simple glaucoma can be treated with levoglaucosan and the tension maintained at a safe level. This has not been our experience with this drug. Our first case responded exactly as described by Hamburger in his original article, but the decrease in tension was maintained for a short time only.

Mrs. P. B., aged fifty-three years, was followed from November, 1925, to March, 1927, during which time she showed a bilateral glaucoma, associated with myopia of 5 D. and tremulous irides, the tension, Schiøtz, ranging from 45 to 70. The visual fields were unaffected, and there were no pathological changes in the nerve-heads, but she suffered from severe headaches over the eyes, radiating to the occiput, and had experienced numerous blurring spells. Operation was repeatedly advised, but refused.

March 7, 1927, vision and refrac-

tion were: O.D. 8/200, —4.25 sph. —1.25 cyl. ax. 180° equalled 20/20; O.S. 8/200, —4.25 sph. —1.25 cyl. ax. 165° equalled 20/20. She read Jaeger 1 with each eye with the addition of +2.50 sph. Tension, Schiøtz, was O.D. 60, O.S. 50 mm.

Glaucosan was administered after the technique described by Hamburger. After three instillations, tension was O.D. 44, O.S. 38 mm. After five instillations, tension was O.D. 23, O.S. 23 mm. Two hours later, tension was O.D. 18, O.S. 16 mm. With the same lenses, vision was 20/25 in each eye.

March 8, vision with correction was 20/20 and Jaeger 1, tension 17 mm. in each eye. March 10, vision with correction was 20/20 and Jaeger 1, tension O.D. 18, O.S. 16 mm., and patient returned to her home in a neighboring city.

March 22, she returned complaining of an attack of blurring of vision two days previously. Vision with correction was 20/20 in each eye. Tension was O.D. 60, O.S. 52 mm. Eserin, 0.25 per cent, reduced the pupils to pin point size, but did not affect the tension.

March 25, vision was as before, tension O.D. 51, O.S. 43 mm. After two instillations of glaucosan it was O.D. 43, O.S. 36 mm. March 27, tension was 17 mm. in each eye.

April 10, the tension was O.D. 55, O.S. 45 mm. Operation was again advised, and on April 11 a corneoscleral trephining with complete iridectomy was done on the right eye, with an excellent surgical result. Convalescence was uneventful and this eye has done very well.

October 2, 1927, vision with correction was 20/20 and Jaeger 1 in each eye, while the tension was O.D. 18, O.S. 43 mm. The fundi were as before and the visual fields were normal. This condition has been maintained to date. There was a good deal of complaint of the eye watering, and Seidel's fluorescein test indicated a leak where the cystoid scar joined the cornea, about the middle line. Lately this sign cannot be demonstrated and the watering is less. Operation on the left eye is still refused.

Four other cases responded similarly with an immediate fall in tension, but the fall persisting only from twenty-four to seventy-two hours. Five similar cases were unaffected by the administration of the drug.

One case, already trephined, maintained a tension of 36 mm. Schiøtz for weeks following the operation in spite of miotics and massage. Levoglaucosan lowered the tension to 23 mm., and, although it soon rose again, it was again lowered by eserin and massage and now maintains a normal level without treatment.

In addition to the fact that the result with levoglaucosan is transient only, there is also danger of precipitating an attack of acute glaucoma by its use. A number of these experiences are now related in the literature, and Hamburger[3] is cognizant enough of the danger to recommend instilling two drops of amin-glaucosan one hour after instillation of the first drop of levoglaucosan. We have seen this condition once in consultation, in the following case.

Mrs. G., aged sixty-eight years, seen in consultation with Dr. J. B. Stanford, was under observation for several months with simple glaucoma, controlled by miotics. The vision was 20/25 in each eye with glasses, the fields concentrically contracted, especially in the lower nasal quadrants, tension O.D. 28, O.S. 35 mm., Gradle-Schiøtz. On November 10, 1927, the tension was O.D. 37, O.S. 32 mm. Levoglaucosan was dropped in each eye and the first drop caused excruciating pain. Five drops in all were administered and the tension rose to 61 mm. in each eye. The condition persisted for a week, and was finally controlled by miotics and rest in bed.

In August, 1928, the vision with glasses was 20/40 and 20/50; tension O.D. 28, O.S. 52 mm. The left eye was operated on, and is still under treatment.

2. **Amin-glaucosan in acute glaucoma**

Our experience with the use of amin-glaucosan in acute glaucoma has so far been very unfavorable. Its method of instillation, after a local anesthetic, is much like that of levoglaucosan, except that only one drop of a two per cent to ten per cent solution is used and it is repeated once only. The reaction is much like that following an initial administration of dionin. There is an intense chemosis of the ocular conjunctiva associated with a burning sensation and a rapid contraction of the pupil. Plentneva[4] of Russia reports nine cases of acute glaucoma treated by the use of this drug, in all of which the pupil was greatly contracted and the tension lowered. D. Pischel[5] in an excellent paper on glaucosan in glaucoma reports one case of acute glaucoma in which the use of amin-glaucosan apparently resulted in lowered tension.

Of six cases of acute glaucoma treated with amin-glaucosan by us, one showed a very slight contraction of the pupil, the others being uninfluenced; not one showed any decrease of tension.

Cases:

(1) Mrs. J. H. Y., aged fifty-five years; acute glaucoma O.S. for two weeks. Tension, 60 mm. Schiøtz, unaffected by miotics. Two per cent amin-glaucosan administered on two occasions without effect. Iridectomy relieved the condition.

(2) S. L., aged seventy-three years; acute glaucoma O.D. for two weeks. Tension 58 mm., lowered to 43 mm. by eserin. Seven per cent amin-glaucosan caused no effect on the pupil or tension. Two days later ten per cent amin-glaucosan was administered with the same result. Iridectomy relieved the attack.

(3) Mrs. A. G., aged fifty years; acute glaucoma O.D. for twenty-four hours. Tension 50 mm. Ten per cent amin-glaucosan decreased the diameter of the pupil from five to three millimeters but had no effect on the tension. Iridectomy cured the attack.

(4) Mrs. A. B. W., aged eighty-seven years, suffered acute glaucoma O.S. three weeks following a combined capsulotomy cataract extraction. Tension was 48 mm., relieved only transiently by repeated posterior sclerotomy. Seven per cent amin-glaucosan was administered on two successive days without effect on the tension. Corneoscleral trephining relieved the pain, but the vision was lost.

(5) Mrs. F. M. S., aged fifty-five years; acute hemorrhagic glaucoma O.S. for one week. Tension 51 mm., lowered slightly by eserin. Ten per cent amin-glaucosan administered twice with an interval of three days caused no further decrease in tension.

(6) Mrs. R. B., aged eighty years; acute glaucoma for ten days. Tension 85 mm. Seven per cent amin-glaucosan did not affect pupil or tension. Iridectomy cured the condition.

3. **Levoglaucosan in acute iritis with posterior synechiæ**

Hamburger in his original paper rather casually mentioned that, because of its active mydriatic effect, levoglaucosan might be used for the rupture of posterior synechia in cases of iritis. We feel that in this condition we have at hand in the form of levoglaucosan one of our most valuable aids for the safety of the inflamed eye.

To illustrate:

Miss E. S., aged fifty-four years, college teacher, came to the office on January 26, 1928, with a history of inflammation in the right eye for eight days. There had been no treatment.

Examination showed all the signs of an advanced iridocyclitis, the posterior corneal surface being almost covered with mutton fat deposits and the aqueous hazy. The pupil was contracted, with practically complete posterior synechiæ. The vision was reduced to moving objects and unimproved by refraction. The left eye was unaffected.

The administration of six drops of one per cent solution of atropin sulphate, combined with hot applica-

tions, over the course of an hour, had absolutely no effect on the iris.

One drop of levoglaucosan was followed within five minutes by complete dilatation of the pupil, leaving a ring of pigment spots on the anterior lens capsule to mark the former synechiæ. There was a good fundus reflex, but no details could be seen.

The patient was admitted to the hospital, atropin and hot applications every four hours were ordered, and a complete physical examination was made, which was entirely negative except for several dead teeth. The next day the pupil was again contracted in spite of the atropin, and a single administration of levoglaucosan caused rapid and wide dilatation.

January 28, four dead teeth were removed. The pupil again tended to contract, and levoglaucosan again widened it completely. From this time on there was no further difficulty in maintaining sufficient dilatation with atropin alone, and the patient made a steady convalescence.

February 21, the right eye was white, and the pupil was large and round. A few pigment spots were present on the capsule and on the posterior corneal surface. The fundus was normal. Vision was 20/40, improved with +0.50 sph. +0.50 cyl. ax. 135° to 20/20.

Mr. J. A. T., aged twenty-nine years, engineer, was seen January 3, 1928, with all the signs of acute iritis in the right eye. The eye had been sore for a week. Vision was 20/50. There was practically no dilatation to atropin.

On January 4, he received a subconjunctival injection of atropin and adrenalin, resulting in a slight dilation of the pupil up and in. Many posterior adhesions were present down and out. That afternoon one drop of levoglaucosan tore all these adhesions save one, and dilated the rest of the pupil widely.

January 5, a subconjunctival injection of two millimeters of a 1 to 1,000 solution of adrenalin chloride opposite the remaining adhesion resulted in rupture of this synechia. From this time on, atropin controlled the dilatation of the pupil, and convalescence was uneventful until complicated on January 18 by an episcleral nodule, which responded to treatment.

February 6, vision O.S. was 20/40, improved with —1 sph. to 20/20.

In nine other cases of acute iritis occurring for the first time, levoglaucosan produced complete dilatation of the pupil with rupture of many preexisting synechiæ, after atropin had failed to produce any appreciable mydriasis.

In one case of sympathetic opthalmia, the use of glaucosan, begun about three weeks after the onset of the disease, was without any effect on the many adhesions existing between the iris and lens.

In eleven cases of recurrent iritis, two with secondary glaucoma, levoglaucosan produced an appreciable dilatation of the iris, with separation of some adhesions and reduction of tension, but did not break any of the old synechiae remaining from previous attacks.

We should like to call especial attention to the utility of glaucosan in this class of cases, namely iritis and iridocylitis with increased tension. It dilates the pupil more effectively than any other drug, and without any risk of further increasing the intraocular tension.

4. Levoglaucosan in old posterior synechiæ

Although levoglaucosan was not claimed to be of any value in old cases of iritis with posterior adhesions, it was used in twelve such cases for the purpose of experiment, without dilatation or rupture of a synechia in a single case.

5. Levoglaucosan in iris synechiæ accompanying injuries to cornea or lens

We have had occasion to use levoglaucosan in six cases followed lacerating or penetrating trauma, in which

the iris had become attached to the corneal wound, lens capsule wound, or lens cortex itself. There is apparently a chemical union of the iris to these injured structures which differs from an ordinary posterior synechia accompanying iritis, for in no single instance were we able to free such an adhesion by levoglaucosan, whereas in two of this same group ordinary posterior synechiæ present coincidentally were instantly broken.

Summary and conclusions.

In our experience,

(1) levoglaucosan lowered the tension transiently in five cases of simple glaucoma; five cases were unaffected; and one was permanently aided. In no case was the tension permanently lowered by the use of glaucosan alone.

(2) amin-glaucosan failed to reduce the tension in six cases of acute glaucoma. It contracted the pupil slightly in a single case.

(3) levoglaucosan was of material aid in breaking fresh iris adhesions in twenty-two cases of acute iritis or uveitis. It reduced the tension in two cases with an accompanying secondary glaucoma.

(4) levoglaucosan is of no value in separating old iris adhesions.

(5) levoglaucosan did not break the adhesion in any case in which the iris was adherent to the point of injury to the cornea, the lens capsule, or the lens cortex.

Exchange building.

Bibliography

[1] Hamburger, Carl. Med. Klin., 1923, v. 19, Sept. 9, p. 1224.
[2] Hamburger, Carl. Arch. of Ophth., 1926, v. 55, Nov., p. 533.
[3] Hamburger, Carl. Klin. M. f. Augenh., 1927, v. 79, Aug., p. 232.
[4] Plentneva, A. Arch. Opht. (Russian), 1927, v. 3, pt. 3, p. 415.
[5] Pischel, D. K. Amer. Jour. Ophth., 1928, v. 11, Sept., p. 705.

PIGMENTATION OF ROOTS OF CILIA CAUSED BY ACARUS DEMODEX FOLLICULORUM

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In two recent cases of pigmentation around the roots of the cilia, accompanied by itching and by a desire on the part of the patient to extract the cilia, living specimens of the parasite Acarus demodex folliculorum were found on the shafts of the cilia which had been pulled out. A well known skin affection in dogs is due to the same cause. Ordinary medicinal remedies seem to have no lasting effect.

For several years the writer has been interested in searching for the cause of pigmentation of the roots of the cilia of the eyelids in patients free from all other eye troubles. Several such cases have come to his attention. Indeed it does not seem to be an uncommon affection. However, up to the present time no other reference to the subject has been found printed in the English language.

The diagnosis is suggested when a patient complains of itching of the lid margins with an intense desire to extract the cilia. The cilia of the upper lid seem to be affected more frequently, and the first roots to become affected are those situated at the outer canthi.

This condition seems to remain on one lid for years. It neither necessarily spreads to other lids nor does it necessarily involve all of the cilia of any one lid. However, in one case which I have been able to watch for several years it does seem that a larger percentage of the cilia of both upper lids are now involved than when the patient was first examined.

A hint of the presence of diseased roots is given when short cilia are seen on the upper lid and the patient gives a negative history as to cilia having been removed for the relief of trichiasis. As soon as the cilia become long enough to grasp they are extracted by the patient. Naturally, healthy cilia are often removed in the attempted removal of diseased cilia. This opens new channels for infection of fresh follicles. Removal of the diseased cilia gives a delightful temporary relief from the intense itching. Cilia with diseased roots can be extracted with much less resistance than those with normal unpigmented roots.

By careful examination with the loupe a black deposit can be seen in the skin around the cilium where it emerges from the follicle. But such cilia are not always found to have dark roots when extracted.

In two cases I have recently been able to demonstrate the infecting agents alive on the shafts of cilia which had been extracted. Rählmann described cases of blepharitis which he considered due to Demodex folliculorum. He states that twenty-five per cent of his trachoma patients were found to have the follicles filled with Demodex acari. By pressure atrophy the cilia are lost. He considers marked pigmentation of the roots of the cilia as pathologic and mentions having found frequently a small transparent filament winding around the hair shaft similar to that which the author has also mentioned.

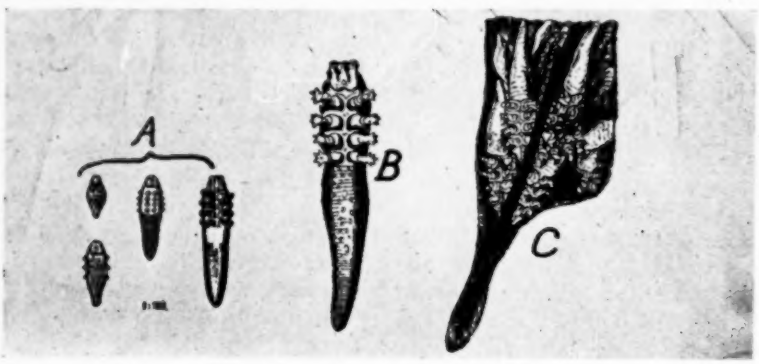
The acarus mite was first described by Berger in 1841 in the external auditory canal of man. But no serious pathology was ascribed to it, and it has escaped recent notice in the human. The following description is taken from Hutyra and Marek's "Pathology and therapeutics of the diseases of domestic animals":

"The acarus is about 0.3 mm. in length and 0.045 mm. in breadth, elongated, lanceolated, with a head shaped like a lyre or a horse-shoe, provided with broad scissors-like masticatory apparatus, a mobile anterior trunk, and three articulated tentacles. It has an oblong or worm-shaped wrinkled abdomen, with eight triple-jointed claws, thick short feet at-

tached to the thorax. These parasites are found in the hair follicles and sebaceous glands, their heads toward the bottom of the sac and their caudal end toward the outer opening. They exist in such large numbers as to cause pressure atrophy of the hair follicle and the hair falls out". (I have noted that this downward position in human cases is maintained even after the hair has been pulled out.) "Relapses after the disease is apparently

upper lid, causing intense persistent itching.

Possibly some change in tissue metabolism at the root of the cilia attracts the demodex. Once started down the hair shaft, it is probably impossible for the organism to turn and leave the hair follicle, due to its relatively large tail. Migration into the depth of the follicle is effected by means of several pairs of legs on each side of the body. The



Pigmentation of roots of cilia (Blackmar): A, development of the acarus folliculorum: egg, six-legged larva, eight-legged larva, and developed larva. B, Acarus folliculorum greatly magnified. C, hair follicle invaded by demodex folliculorum.

(From Hutyra and Marek, "Pathology and therapeutics of diseases of domestic animals.)

cured may be due to encysted forms of the parasite. It is not very easily transferred from one animal to another. To propagate the disease the animal must have a certain predisposition, the nature of which has not been satisfactorily explained. There is no doubt that some individuals are immune".

Demodex folliculorum has been described as a harmless inhabitant of the skin. Stelwagon states that Acarus folliculorum was formerly thought to be harmless but recent instances of pigmentation of the face due to it have been reported. The pigment was of a fawn or brownish tint. The chin and lip are favorite sites. The pigmentation is most marked around the follicle opening. In some cases, for a reason as yet unknown, it involves the follicles of the head and body enter first, acting as an entering wedge and pulling the large long tail behind. The hair shaft is grasped firmly by the animal's legs, and by pulling itself down the shaft it burrows deeper and deeper into the follicle, separating the sides of the follicle from the hair shaft.

In dogs a diagnosis of "red mange" is made from finding the demodex in scrapings from the surface of the skin, in a simple unstained smear under the low power of the microscope. I attempted this and only found numbers of small dark spherical bodies. Then cilia were extracted and examined fresh, both with and without a cover slip. Still nothing new could be seen. Finally, with an ordinary condensing lens such as is used for focal illumination of the eye, light was concentrated on the cilia with-

out any light being transmitted from the reflector below the stage. Then on the hair shaft the golden yellow demodex could be plainly seen alive, holding on to the cilia with its legs. The large tail could be seen to move slowly back and forth and now and then a leg could be seen to move.

This infection in dogs is considered incurable. Various medicinal agents give relief, but recurrences are the rule. The usual balsam of Peru ointment has been used by my patients with some relief from the itching, but so far I am still unable to report a cure. A number of antiseptic agents will give relief from itching for a time. In treated cases the demodex can at times be demonstrated on the sides of extracted cilia, its motility lost. After still longer treatment its presence can not be demonstrated, but since the infection returns it is assumed that ova or other dormant forms must remain in the hair follicle.

In 1926 the failure of attempted cultures and animal inoculations was reported. A few dark-colored spherical bodies were removed from the surface of agar slants after a number of days incubation. They were thought to be single gram-negative cocci, but further investigation has probably revealed their true nature. These dark spherical bodies found on the lid margins and in the culture tubes in which infected cilia had been placed may be the excretions of the demodex; and it may be that this substance is the cause of the apparent pigmentation.

408 Woolworth building.

References

Mentioned in text:

Blackmar, F. B. Amer. Jour. Ophth., 1926, v. 9, Oct., p. 753.

Hutyra and Marek. Pathology and therapeutics of the diseases of domestic animals, v. 2, p. 1048. Translated from German by Herzog, Shelher, and Mayall, 1920, Alexander Eger, Chicago.

Rählman, E. Blepharitis acarica. Deut. med. Woch., 1898, v. 24, pp. 789, 810.

Rählman, E. Ueber Blepharitis acarica. Klin. M. f. Augenh., 1899, v. 37, p. 33.

Römer. Textbook of ophthalmology, p. 291. Translated by Foster, 1917, Rebman Co., New York.

Stelwagon. Diseases of the skin, eighth edition, p. 37. W. B. Saunders and Company.

Additional references:

Herzog, H. Erkrankungen der Lidhaut des Menschen bei Demodexmilben. Arch. f. Ophth., 1908, v. 69, p. 402.

Hunsche, K. Vorkommen des Demodex folliculorum am Augenlide. Thesis published in München, 1900; also Münch. med. Woch., 1900, v. 47, p. 1563.

Müller and Glass. Diseases of the dog, fourth edition, pp. 469-475. Translated from German by Spang, Sommer, and Jureasu. Alexander Eger, Chicago.

Oyenard, A. Frecuencia y valor patogeno del Demodex folliculorum en los parpados. Arch. de Oft. Hisp.-Amer., 1908, v. 8, p. 97.

Stcherbatchoff. Le demodex folliculorum dans les follicules ciliares de l'homme. Thesis published in Lausanne, 1903.

Stieda, L. Ueber das vorkommen des Haarbalg par Asciten (Demodex folliculorum) an den Augenlidern. Centralbl. f. prakt. Augenh., 1890, v. 14, p. 193.

CONGENITAL UNILATERAL PARALYSIS OF THE MOTOR OCULI

With case report

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The girl patient was observed at the age of twelve years. An operation for spina bifida had been done at the age of three years. From birth the right upper lid had drooped and the right cornea had been rotated nasally. The intrinsic muscles were unaffected, the medial rectus was spastic, the levator and the superior and inferior recti paretic, and the inferior oblique paralyzed. The condition is explained on the basis of developmental defects in the nuclei of the third and sixth nerves. From the department of ophthalmology of the State University of Iowa Hospital and College of Medicine. Read at the annual meeting of the Sioux Valley Eye and Ear Academy at Sioux City, Iowa, January 22, 1929.

Case report: Miss P, age twelve years, is healthy in appearance. Her birth was by cesarian section. The patient was born with a tender tumor connected with the spinal membranes (spina bifida) at about the level of the waist; this was corrected by operation when she was three years old. From birth the right upper lid drooped and the right cornea has been rotated nasally; these conditions have persisted and are intensified by general fatigue. She has had whooping cough, measles, and chicken pox. Her tonsils were removed at the age of three years. She had influenza complicated with bilateral ear infection at three years and has had many ear infections since, but none during the past two years. The patient is the second of two children, the first of whom died at birth in 1913, presumably in consequence of dystocia. The family history is negative.

The writer is indebted to Dr. James W. White, who examined the patient in 1922 with Dr. Alexander Duane, for information from which the following notes were abstracted: V.O.D. =6/9, V.O.S.=6/15, corrected to 6/7.5 each eye. With atropin +0.50 D. sphere was found for each eye. Binocular single vision with fusion was demonstrated. The pupils were normal and reacted equally. Right ptosis was present. Rotations or excursions: up and right, O.D. nil; up and left, O.D. nil, but has spasmodic inversion; down and right, O.D. nil, but out quite well; down and left. O.D. normal or increased.

Examination January, 1929: V.O.D. =6/15, V.O.S.=3/60, V.O.D. with O.S.=6/10—2. V.O.D.—2.00 D.S.= 6/12 (static). V.O.S.—4.00—0.75 ax. 180°=6/7.5 (static). Accommodation active. Near point of convergence (downward) 2 cm. Pupils normal; equal in size and reactions.

The writer is indebted to Dr. Clarence Van Epps for conducting the neurological examination, which he reported was completely negative.

The behavior of the patient's right eye (center column), compared with that of the patient's normal left eye (right hand column), and with that of a normal right eye (left hand column) in the primary position and on attempted conjugate rotations is shown in the table.

Directions of ocular rotations

Normal R.E.	R.E. with paralyzed third nerve	Normal L.E.
primary position	in and down	primary position
in	in and down	out
out	out and up or down	in
up	in	up
down	down and out	down
up and in	in and down	up and out
down and in	in and down	down and out
up and out	down and in	up and in
down and out	in and up, or down, or out, or out and down	down and in

(In the second column the predominating direction is placed first.)

Discussion: An analysis of the table reveals the activity of the right lateral rectus, which, while the left eye is in the primary position, appears to be paralyzed. The activity of the right superior oblique is shown while the left eye is in the primary position and while the left cornea is directed out and either up or down. No paralysis is present in these two muscles.

The extent and degree of the motor oculi paralysis is indicated by a study of the muscles supplied by that nerve. The levator and the superior and inferior recti are weak and limited in action, the medial rectus appears to be spastic, and the inferior oblique is practically inactive. The iris and ciliary body are not affected. The medial rectus is overactive while the left eye is in the primary position and in four or five of the six conjugate rotations or cardinal directions of gaze. It may be spastic, or only apparently so, because of pontine impulses through the left lateral rectus. Or a contracture may occur in the opponent of a paralyzed muscle, and the contracture may persist and prevent the restoration of binocular vision after the paralysis has been cured[1]. Paralysis of the abducens is met with most frequently, and the next in order of frequency is unilateral paralysis of the motor oculi[2]. The right lateral rectus may have been paralyzed originally, and later cured.

The nucleus of the abducens nerve may be regarded as a pontine nucleus[3]. Apparently no normal binocular rotation is performed without one or the other lateral rectus dominating the action. The lateral rectus is supplied by the abducens nerve, the superior oblique by the trochlear, and the remainder of the muscles by the motor oculi, which also supplies the intrinsic muscles for pupillary contraction and accommodation. A paralysis of the motor oculi may be complete or incomplete; it may affect the intrinsic and extrinsic, the intrinsic only, or all or only part of the extrinsic muscles. The extent and degree of the paralysis is oftentimes of value in localizing the causative lesion.

In a complete paralysis ptosis is total and the upper lid cannot be elevated. The cornea is directed out and slightly down; it cannot be rotated in any direction except temporally. Proptosis is present but not always pronounced. The pupil is moderately dilated and inactive. Accommodation cannot be performed. (All these signs were found in a case of ophthalmoplegic migraine (Charcot), affecting the right side, second attack, while this study was being prepared.)

Incomplete forms require a study of the plan of innervation for the components of both extrinsic and intrinsic muscle groups. The motor oculi nucleus is composed of masses of cells. The cells of each mass give rise to a bundle or fasciculus of fibers that traverses the cerebral peduncle and red nucleus; these unite to form a trunk which divides and enters the orbit by two branches. Within the orbit each original fasciculus reaches its destination, either a striped muscle or the ciliary ganglion.

Bing[4] and other writers diagram the arrangement of the nuclear masses. A central mass at the cephalic end of the bilateral group presides over accommodation, while on either side of it are masses that act on the sphincters of the pupils. From before backward are found masses for the levator, superior rectus, medial rectus, inferior oblique, and inferior rectus. According to the diagram, fibers from the masses for the levator and superior rectus are distributed to the homolateral side, for the medial rectus and inferior oblique to both sides, and for the inferior rectus to the contralateral side. Theoretically, any general lesion of the nucleus on either side should involve muscles in both orbits.

A conflict between anatomical and clinical observations exists, for both complete and incomplete forms of motor oculi paralyses are frequently limited to one orbit. Unilateral pa-

Congenital unilateral paralysis of the motor oculi (Rutherford). The numerical sequence of the photographs conforms to the arrangement of the table "directions of ocular rotations," appearing in this article.

ralyses of ocular muscles are almost alway of nuclear or infranuclear type[5]. Nuclear paralyses of the motor oculi are, in consequence of the great extent of the nucleus, seldom total; the sphincter pupillae and musculus ciliaris generally remain unaffected[6]. Unless extensive, nuclear lesions are apt to cause partial paralysis[7]. A nuclear origin may be with some certainty assumed when there is a paralysis of those branches of the third nerve which are distributed to the extrinsic muscles only[8]. When two muscles, each acting vertically, are at the same time alone affected, it is less difficult to suppose that the disabling factor passes from one to the other side of the nuclear mass[9]. Lesions might involve chiefly the cephalic portion of the right nucleus and the caudal portion of the left, although they would probably be sharply circumscribed.

A nuclear paralysis is caused by a lesion which includes one or more of the cell masses in the nucleus and which produces a paralysis in accordance with whatever masses are affected. A failure in development or an arrested development in the nucleus can result in a similar paralysis. A lesion in the peduncle or red nucleus may cause a fascicular paralysis. A lesion that involves the nerve trunk may be expected to produce a complete paralysis. If it involves but one of the two branches, the muscles supplied by that branch will be paralyzed. In lesions of the fasciculi, trunk, or branches the paralysis is designated as infranuclear. A supranuclear paralysis is one caused by a lesion above the nucleus; that is, in the cortex or in the pons. Such paralyses may be expected to affect both eyes but may cause unilateral ptosis.

Ocular paralyses may be classed etiologically as (1) developmental or hereditary and (2) inflammatory or traumatic. Both classes are usually characterized by wide differences of expression in individual cases. The hereditary form generally has ptosis as a prominent symptom, and the ptosis is usually bilateral. An inflammation may be responsible for almost anything. Trauma to the orbit or skull usually affects the lateral rectus, and other paralyses are added to it. The intrinsic muscles may or may not be involved in either class.

The striped orbital muscles arise from a common premuscle mass, first recognized in human embryos of about seven millimeters length; at this stage the motor oculi nerve only is demonstrable. In embryos of nine millimeters length the mass begins to show cleavage into separate muscle masses; the trochlear and abducens nerves are now demonstrable. At eleven millimeters length the mass is continuous with the primitive sclera. At fourteen millimeters length all the orbital muscles are distinguishable and have about the same relations to the globe as in the adult, except that the inferior oblique has not completely separated from the inferior rectus[10].

One could infer that an anomaly in development in the muscle mass or nerve distribution might have occurred, but it is more probable that the lesion exists in a nerve center. In the early stage an aplasia of the nucleus does not cause an aplasia of the muscles[11]. Abnormal insertions and other anomalies of the muscles could be determined at present only by vivisection.

Myelin sheaths might form about some of the nerve fibers in an imperfect manner. A comparison can be made with the lesions of disseminated sclerosis, in which disease paralysis, usually incomplete, of the extraocular muscles occurs in seventeen per cent of cases[12]. Defects of the myelin sheaths might consistently coexist with defects in the masses of nuclear cells. A lesion in the medial longitudinal bundle or other association pathways or centers would likely involve more muscles than are affected in this one orbit.

The unborn child is subject to few diseases. One born by cesarian section should escape trauma. There is no present evidence of disseminated

sclerosis. Polioencephalitis does not affect the eye muscles in infants[13]. Paralysis of the ocular muscles from inherited syphilis is comparatively unusual[14]. No relationship between motor oculi paralysis and spina bifida has been established. Chronic suppurative otitis media can not be seriously considered as the cause.

Summary

The intrinsic muscles are unaffected, the medial rectus is spastic, the levator and the superior and inferior recti are paretic, and the inferior oblique is paralyzed; it is improbable that the lesion lies peripheral to the peduncle. A lesion involving the fasciculi within the peduncle or red nucleus should be accompanied by other phenomena. Infranuclear lesions therefore may reasonably be excluded. As conjugate rotations are functions of the cortex or pons and are bilateral in effect, supranuclear lesions may reasonably be excluded. The whole possible pontine influence is exhibited by the behavior of the right medial rectus apparently in response to impulses associated with the left lateral rectus. The latter muscle dominates the former in conjugate rotations, and it is possible that a separate nuclear cell mass is provided for stimulating the medial rectus to obey impulses transmitted from the opposite abducens nucleus.

Conclusion

By deduction and exclusion the etiological factor in this case consists of defects in the masses of cells composing the nucleus, with or without defects in the myelin sheaths of the nerve fibers. The defects probably consist of aplasia in the cells of portions of one or both nuclei.

University hospital

References

[1] Fuchs, E. Textbook of ophthalmology, 8th ed. revised, 1924, p. 309.
[2] De Schweinitz, G. E. Diseases of the eye, 10th ed. revised, 1924, p. 622.
[3] Bing, R. Regional diagnosis, 2nd ed., 1920, pp. 149-151.
[4] The same, p. 147.
[5] The same, p. 151.
[6] The same, p. 152.
[7] Peter, L. C. Extraocular muscles, 1927, p. 264.
[8] Stevens, G. T. Motor apparatus of the eyes, 1906, p. 479.
[9] The same, p. 480.
[10] Lewis, W. H. In Keibel and Mall, human embryology, 1910, v. 1, p. 505.
[11] Kunn, quoted by Schmidt-Rimpler, H., in "Die Erkrankungen des Auges im Zusammenhang mit anderen Krankheiten, 2nd ed., revised, 1905, p. 196.
[12] Uhthoff, W. quoted in American Encyclopedia of Ophthalmology, 1915, v. 6, pp. 4041-4043.
[13] Dana, C. L. Nervous diseases, 4th ed. revised, 1897, p. 262.
[14] De Schweinitz, G. E. Diseases of the eye, 10th ed., 1924, p. 618.

CONGENITAL BILATERAL ANOPHTHALMOS

Case report

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One paternal uncle had unilateral congenital anophthalmos. The patient's parents were normal, and the other seven children of these parents were normal. The patient, seven years old at the time of examination, had not walked until the age of four years, his speech had always been defective (without apparent physical cause outside the eyes), and he was of lower mentality than is shown by most children born with eyes but blind from infancy. Palpation did not reveal any rudimentary eyeball or optic nerve. From the Wilmer Ophthalmological Institute, Baltimore.

Congenital bilateral anophthalmos is a rare anomaly, and the literature on the subject is quite limited, so that it may not be without interest to report the following case, with photographs of the patient and of the empty conjunctival sacs, and wax models of these cavities.

During the past twenty-five years, thirty-three cases of congenital anophthalmos have been reported. Of these, twenty-five were bilateral and eight were unilateral. The ages of the patients varied from a few hours to six years; no account has been given of their subsequent development. In five instances, a thorough anatomical and microscopical examination of the orbital contents was made; and in three of these a rudimentary nodule, composed of a fibrous capsule enclosing a pigmented mass, was found. The other two did not contain the vestige of an eye. One only of the thirty-three came to autopsy; this case was reported by Gallemaerts[1] of Brussels in 1924. He stated that the skull was normal and that the occipital lobes were present. There was no trace of an optic nerve, chiasm, or tract. The fourth and sixth nerves were absent. The sella was normal. The orbital muscles were present. No trace of an eye, orbital cyst, or rudimentary nodule was found.

The family history of these cases is interesting. In fifteen per cent, some congenital anomaly existed in a parent or other relative. In three instances, more than one member of the family presented eye anomalies. McMillan[2] reported four cases. All were members of the same family and children of normal parents. In one instance there was bilateral microphthalmos; in three there was anophthalmos on one side and microphthalmos on the other.

Etiology: Most authors feel that the condition is due to an arrest of development of the primary optic vesicle early in embryonic life. Mann[3], in her book on "The development of the human eye," states that true anophthalmos results if one or both of the primary optic vesicles fail to bud out from the forebrain, but that the abnormality, though known to occur, is extremely rare, since an aberration of growth gross enough to produce complete suppression of the front of the forebrain, occurring at an early stage, is apt to end in the production of an embryo too abnormal to survive at all. In some instances it is impossible to distinguish clinically between an extreme case of micropthalmos and anophthalmos. Only removal of the contents of the orbit, with careful microscopic examination, can determine the true nature of the case.

Ochi[4] injected ether into chick embryos, and, in his account of an experimental study of the histogenesis of eye abnormalities, concluded: "At the beginning of the development of the embryo, any factor, either chemical or physical, which can disturb the normal condition of the blastoderm itself or its circumference, may bring about an abnormal differentiation of the embryo. If such disturbance of the normal condition is too great, development of the embryo may be en-

tirely arrested. But, if development is still possible, some deformity of the embryo may result, especially teratoma of the head and abnor-

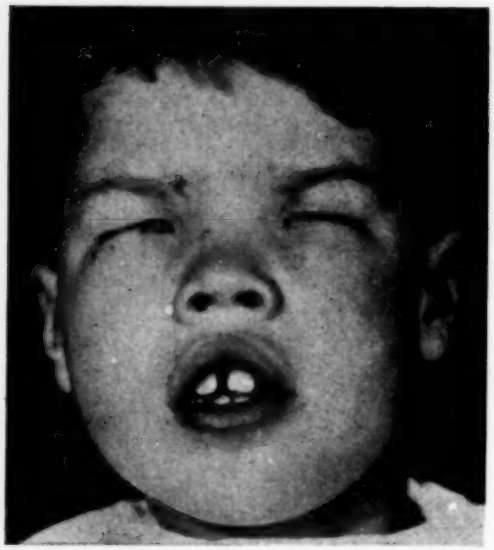

Fig. 1 (MacLean). Congenital bilateral anophthalmos.

malities of the eyes, varying according to the degree of disturbance."

Case history: J. L., aged seven years. The parents state that birth was normal. The doctor who was present at the delivery commented on the absence of the eyes, but pronounced him a normal baby in every other respect. No further examination was made until his admission to the Wilmer Institute in November, 1928.

The family history is interesting. One paternal uncle has unilateral congenital anophthalmos. He is now thirty years old and apparently in good health. The parents of the patient are normal. The patient is the seventh of a family of eight. All the other children are normal and healthy.

The patient did not walk until the age of four years. His speech has always been defective, but he can make himself understood fairly well. He does not feed or clothe himself, but can make known his needs. His sense of direction is excellent, his touch very delicate, and his hearing very acute. Dr. Richards, of the department of psychiatry, is of the opinion that the rather low mental status cannot be wholly explained by blindness, but is probably due to an actual lack of mentality, as the child does not show the same adjustment to his environment that is shown by most children born with eyes but blind from infancy.

Examination was negative, with the exception of malnutrition and general underdevelopment. The boy was about two years under the physical standard of a seven-year-old child. His height was forty-two inches and his weight forty-one pounds. There was no evidence of rickets. Wassermann reaction was negative. X-ray examination of the head showed no abnormalities of the skull; the sella turcica was normal; the optic foramina were present but small. A careful nose and throat examination did not reveal any mechanical cause for the speech defect. The epiglottis was normal. The bony arch of the palate was normal, but the vocal cords could

Fig. 2 (MacLean). Congenital bilateral anophthalmos—right socket.

not be seen. Otological examination revealed infantile ear drums, which are very unusual in a child of this age.

Examination of the orbits was made under general anesthesia. There was marked epicanthus, with a slight tendency to entropion, especially of the upper lids, and marked ankyloblepharon. Cilia and puncta of all four lids were normal. The length of the palpebral fissure was twelve millimeters, and the width, at greatest stretch, thirteen millimeters. The orbital cavities were lined with mucous membrane, and the greatest depth to the lowest point was twelve millimeters. Careful palpation of the sockets did not reveal any evidence of a bulb, cyst, rudimentary nodule, or optic nerve, although the foramina could be felt. Figures 2 and 3 are photographs of the sockets showing the ankyloblepharon and the deep cone-shaped cavities extending to the apices of the orbits.

Fig. 3 (MacLean). Congenital bilateral anophthalmos—left socket.

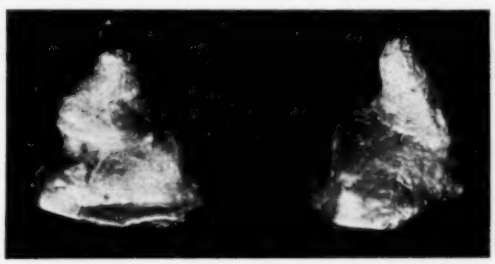

Fig. 4 (MacLean). Congenital bilateral anophthalmos—wax models of sockets.

Figure 4 is a photograph of the wax models of the orbits.

Treatment: Lotin[5], in the Russian Ophthalmological Journal, June, 1928, described some methods of plastic restoration of the conjunctival sac in anophthalmos and in atrophy of the eyeball. In the present instance, it would be possible to perform a plastic operation which would permit the wearing of artificial eyes. This would relieve the irritation from the inturning lashes and improve the appearance of the child.

Wilmer Ophthalmological Institute.

References

[1] Gallemaerts. Congenital familial anophthalmos, Ann. d'Ocul., 1924, v. 161, pp. 490-496.
[2] McMillan, L. Anophthalmia and maldevelopment of the eyes; four cases in the same family, Brit. Jour. Ophth., 1921, v. 5, p. 121.
[3] Mann, Ida. The development of the human eye, Cambridge Press, 1928.
[4] Ochi, S. Experimental study of histogenesis of eyes; abnormality in chick embryos, Brit. Jour. Ophth., 1919, v. 3, p. 433.
[5] Lotin, A. V. On some methods of plastic restoration of the conjunctival sac in anophthalmos and in atrophy of the eyeball, Russkii Opht. Jour., 1928, June, pp. 681-692.

AFFECTIONS OF THE EYE IN LEPROSY

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The patient had been released from a government institution as an arrested case of leprosy. But he developed a typical leprous iridocyclitis, the progressive changes of which are described in detail, and which culminated in extensive atrophy of the iris and in cataract. Temporary advantage was had from extraction of the cataract, but blindness ensued. Nine years after the patient's release as an arrested case, the bacillus of leprosy was found in a lesion on the foot.

Eye changes, inflammatory or otherwise, are rather prevalent in leprosy, though total blindness is comparatively rare. It will be readily seen that when a disease which causes such destruction elsewhere in the body affects the eye, it is likely to produce destructive effects on the delicate organ of sight.

Loss of lashes and loss of eyebrows are early symptoms. The eyebrows are affected first, and the lower lid is said to lose its lashes before the upper. Comment is made on the frequent occurrence of an adventitious fold of the skin of the upper eyelid, which falls in front of and hides the lashes, due to the absorption of leprous infiltrations leaving the skin overstretched and atonic. This condition is suggestive of blepharochalasis.

Superficial punctate keratitis is more frequently found in lepers than in healthy people. This condition was noted in the case reported below, and some have claimed that this affection is specific.

The most common affection in leprosy is iritis or iridocyclitis, which often heals up without special treatment, but in other cases, as in the one now reported, results badly. Rather significant is the atrophic appearance of the iris. Others have noted this, and in the present case the marked atrophy, with absence of crypts, is described in detail.

Fuchs describes the "yellowish translucent nonvascular nodules" which generally develop near the margin of the cornea, lying both in the conjunctiva and in the subjacent sclera, and sometimes growing out upon the cornea. With these is later associated iritis, sometimes combined with the formation of lepra nodules in the iris, also cyclitis. It seems it is the breaking down of the nodules in the different parts of the eye that finally causes its destruction. My case being one of "arrested" leprosy, no nodules were seen in the external eye, but its characteristics were the attacks of low grade iridocyclitis and the atrophic iris.

Iridocyclitis occurred in twenty per cent of Van Driel's cases. He also noted that leprous pannus, a sequel of the conjunctivitis and of the limbal infiltration, is common. It has been described as "ivory-like pannus". He does not believe that the eye is invaded from the skin, but holds strongly that the infection reaches it through the circulation.

My attention has just been called to the difficulty of operating on the eye in many of these cases, due to the destructive changes which have taken place in the nostrils, and the resulting lacrimal sac affection. Park Howell told me he had observed a tendency to lagophthalmus, which he feels in some cases is due to a paresis of the orbicularis, in addition to those instances which may result from loss of sensation in the cornea.

Case: This patient was first seen in 1919, a white male then thirty-one years old. He had just been released from the Carville Leper Colony, where he had been for five years. Several blood examinations had been made (Chilton Worth) which were all "negative". His vision was 20/200 in each eye and he had a saddle-bridge nose, and absence of soft palate and of lashes. The right pupil was obliquely oval, being drawn towards 4:30 o'clock (1.5 by 2 mm.), and it reacted slightly

to light. At this point there was a small grayish white deposit which it was thought at that time might be a synechia. The left eye presented the same condition of the iris at the lower nasal margin. The pupil was about 2 × 3 mm. and was directed upward and temporally. From this point, at both sides of the sphincter and extending about five millimeters into the iris along axis 75°, there was a brownish pigmented area, or absence of the color seen in the rest of the iris. This gave the appearance of an operative coloboma. There were small defects in this portion of the iris, constituting accessory pupils. There was a typical fine white punctate spot of lepra on the left iris. The right eye showed punctate keratitis, while the left showed some atrophy of the cornea and numerous fine deposits of Descemet's membrane.

The patient was again seen in 1921, when vision had been reduced to counting fingers at about two meters. During this time he had been subjected to various mild attacks of a cyclitic type of inflammation, oftentimes associated with some hyphema. It was never clear just where this blood came from. At this time a detailed description was recorded of the status of each eye, as follows:

Right eye: An almost round, half-millimeter pterygium on nasal side. Cornea perfectly clear; anterior chamber fairly deep. In lower angle, between five and six o'clock, small brownish tag of iris almost in contact with cornea. Iris greenish brown, gives impression of atrophy in radial areas. Between these atrophic areas, iris appears more spongy, translucent. At temporal side, about nine o'clock position, narrow triangular area beginning at limbus and extending to region of sphincter, coffee-brown in color, no detail of stroma. Sphincter portion cannot be distinguished clearly from ciliary portion. The fringe is gone; marked atrophy of iris at pupillary margin, especially about four o'clock and between nine and eleven o'clock, in these areas iris whitish opaque with little brown spots. Pupil somewhat irregular, showing a trace of reaction; no nodules in iris.

Left eye: Cornea vertically oval, about nine by ten mm. At upper margin, fine superficial saturated well-defined radial opacities extend from limbus into cornea for about 1.5 mm. Adjoining it toward center of cornea, faint superficial somewhat irregular opacity, the whole reminding one greatly of the pannus of trachoma. Balance of cornea apparently perfectly clear. Anterior chamber somewhat deeper than right. At lower angle, between five and six o'clock, small tag of iris in contact with posterior surface of cornea. Iris less brownish, looks more uniform brown, though impression is as if in peripheral portions (ciliary) iris is atrophic and pigment epithelium can be seen through. Stroma does not give spongy impression as in right eye. Looks more normal—if anything, appears somewhat thinned as if put on a "stretch".

Between twelve and two o'clock, stroma of iris absent between pupillary margin and a point apparently one millimeter from angle of anterior chamber. The edges of this defect, which simulates an iridectomy, are somewhat rounded off and the upper edge of the defect is hidden behind the above-mentioned opacity in the cornea, making positive statements almost impossible. In this area of atrophy of the stroma, a coffee-brown membrane fills the gap. This membrane shows a fine slit-like defect (hole) at the nasal margin of the coloboma. A similar but broader defect (hole) is found at the lower end of the temporal pillar of the coloboma.

Another apparent defect is found at the pupillary margin of the brown sheet which fills the defect in the stroma. This defect produces an increase in size of the pupil, making the pupil appear 3 by 5 mm. with its long diameter at axis 75°. At the lower pupillary margin of the iris—the only part of the actual margin which is

still in existence—a whitish membrane is found fixing iris to capsule (?). In this iris also there is no differentiation between pupillary and ciliary portions. Fibers of iris in upper nasal quadrant show somewhat abnormal direction, pointing more towards seven or eight o'clock, the beginning of the whitish membrane at the pupillary margin. Pupil in center of iris—that is, what is still present of original pupil—apparently gives no reaction. No white nodules in iris.

Fundus, right eye; no view of fundus, only faint whitish overlaid red reflex (capsular opacity of lens); left eye; good reflexes everywhere but no fundus details.

The patient was seen at various times during the intervening three years, and early in 1926 considerable degenerative changes were noted, the right eye showing a sector of marked atrophy of the iris, leaving only the retinal pigment layer. In the angle of the anterior chamber there was a gray-brown flaky mass which had been described previously as an anterior synechia. The atrophic area which formed the pseudocoloboma in the left eye was more marked, the holes in this pigmented layer being larger. There was the fine white spot (concretion?) on the pupillary margin which is said to be typical of lepra. Through the openings in the iris could be seen the grayish lens, which had now become decidedly cataractous. Later the iris appeared slightly tremulous, and the impression was that the lens had shrunken somewhat. Two months later, the patient developed pain in the right eye, conjunctival and ciliary injection being moderately severe, with small hypopyon. This gradually cleared up under atropin, dionin and mixed treatment, but recurred six weeks later, to again react to treatment.

In July, 1926, the cataract was extracted, and later discission of after-cataract was performed and vision of 6/200 was obtained with correction. Within the next few months, however, the sight gradually failed with no other apparent symptoms. In November, 1926, severe ciliary injection developed, with a two millimeter hyphema. This inflammation subsided and the hemorrhage was absorbed, but the vision of the eye was lost. In February, 1927, the cataract was extracted from the right eye, with iridectomy. Because of the fragile condition of the atrophied iris, the iridectomy was performed piecemeal. Vitreous, watery and fluid, oozed out during the delivery of the lens and a considerable amount afterward. The only vision obtained in this eye was hand movements.

From that time and into the present year the patient had several low-grade inflammatory attacks in each eye, the more severe being in the left eye in March, 1928, when there was hyphema with exudate in the angle of the anterior chamber, and loops of new blood vessels on the lower portion of the posterior corneal surface. Tension was minus one. Later, some of the blood in the anterior chamber absorbing, it was noticed to extend back through the pupil into the vitreous. Though the eye quieted it gradually shrank, the cornea becoming flattened and wrinkled, and the anterior chamber funnel-shaped, until at the present time there is well established phthisis bulbi.

The present status of the right eye is as follows: Slight shrinking, cornea flattened especially above. Anterior chamber practically obliterated, with the iris irregularly against the cornea, mushroom-like. The iris is thin and fragile and is drawn up to the center of the previous operative incision. Only a thin linear remnant of the pupil (coloboma) is seen in the upper part of the vertical meridian, which itself is sealed in by organized exudate. The iris in the upper portion especially is so thin that it seems but a fragile shell, and with retro-illumination gives the appearance that a piece of printed cloth would give if held up to the light. The color of the iris is slate-gray.

It had been our intention to at-

tempt to form an opening in the iris by iridotomy, since there was light perception and some projection. However before admitting him to the hospital, a routine examination revealed a suspicious lesion on the foot, and a scraping proved positive for the bacillus of leprosy. Thus a case of "arrested" leprosy, treated for five years with chaulmoogra oil at a United States leprosarium, and released for nine years, still has the disease.

In reviewing the literature of recent years, I found that Van Driel had given much information on eye conditions in this disease, and I have made considerable use of his reports. Dr. Park Howell of this city, visiting oculist of the Carville (Louisiana) Leper Colony, has also helped me with general information on the eye changes as seen by him at that institution.

Maison Blanche.

WHICH CHILDREN SHOULD ATTEND SIGHT-SAVING CLASSES?

Dr. M. Bartels

(Abridged translation* by Peter C. Kronfeld, M.D., University of Chicago)

For those whose defects are stationary, the range of vision should ordinarily lie between 2/50 and 1/4, with a few exceptions up to 1/3 and down to 1/50. Most cases of refractive error are to be considered purely according to their range of vision. Those who have myopia of more than eight diopters at the time of commencing school life should be included, but need to attend the special classes only for departments of study that particularly tax their visual acuity. Children who suffer from asthenopia but have good visual acuity should be under medical care, but should not be placed in sight-saving classes. The address was delivered before the fifty-first meeting of the Rhenish and Westphalian Ophthalmologists, Düsseldorf, Germany, November 27, 1927; and the translation is now published by request of the National Society for the Prevention of Blindness.

There is a group of children who fall into a class between those who are totally blind and those who are normal. These are children who have too much vision to allow them to attend a school for the blind, and yet have so little vision that they are unable to keep up with their work in the regular schools. If they are permitted to attend a blind school, they are difficult to teach in the regular way because they use vision instead of touch for learning the blind script. If they are permitted to go to an ordinary school, their mental development is stunted.

Educators in many countries have learned by experience through several decades that these children can be taught very well in special classes. Of great importance is the fact that the classes are much smaller than those in the regular schools. Ten or at the most fifteen students are assigned to one class. The time of teaching, reading, and writing is limited to ten or fifteen minutes, and most of the instructing is done verbally. The senses of hearing and touch are chiefly used, and in this way the eye is saved as much as possible.

Principles of selection of children for these schools

In the first place we shall consider the children with permanently defective vision. The problem of how poor the vision must be to justify acceptance in a sight-saving school involves two questions:

a. Which children have too much visual disturbance to be taken into a sight-saving school and therefore should be in an institution for the blind?

b. Which children have not vision enough to attend a regular school?

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*The author has given formal permission for publication of this abridged translation of the original address which appeared in the Klinische Monatsblätter für Augenheilkunde, 1927, volume 79, page 796. The abridgement has been made by the author himself.

Thus we get the upper and the lower limit for visual acuity. We have been taught by practical experience that the minimum amount of vision which enables otherwise normal children to attend sight-saving schools is very low. I myself know several children with retinitis pigmentosa and vision of 1/50 who (being watched very carefully) got along very nicely even in regular schools and learned to read and write large script. That does not hold true except for mentally normal children, who alone should be taken into sight-saving schools. Feeble-minded children belong in special schools.

It depends not only on the clearness of vision, but also on the teacher, the parents, and the other pupils whether or not children with visual acuity of 1/50 make progress in a sight-saving school. At any rate it should be tried, as the results so far have shown that it can be done. Such children are retarded unjustly in institutions for the blind. Children are found there with as much visual acuity as 7/50 who before being placed in the blind schools had already learned to read and write, but who on account of their poor vision did not get along in the regular school and for that reason fell behind the children with good vision. Then they forgot reading and writing and learned the blind script poorly.

In my paper on the definition of blindness and the problem of sight-saving, I fixed the lowest limit for sight-saving at a visual acuity of 2/50. It was this same limit which was agreed upon at the Blind Congress (in 1927). The resolutions there accepted say: "A child is blind or practically blind with a vision of from 0 to 1/25". This vision does not enable the child to get education as a normal child nor an orientation which is based on visual impressions, nor training for a trade for which sight is necessary. The child is "poor-sighted" with a visual acuity of from 1/25 to 1/4 if this vision is sufficient to learn reading and writing in the manner of a seeing person, using the principles of hygienic pedagogy, and if the vision is sufficient to learn a trade in the manner of a seeing person.

This upper limit for blindness, which also represents the lowest for persons classified as having impaired vision, can be fixed at 1/50 (counting fingers at three feet) provided the special conditions mentioned before are fulfilled. Berlin even accepts children with a visual acuity of 1/50 for sight-saving schools. Leipzig does the same, Hamburg has set the limit at 2/50. Strassburg sends children with 1/50 to an institution for the blind.

The upper limit for poor sight varies much more. The reports about sight-saving schools state that the upper limit was raised after some time. Strassburg takes all children out of the regular school who have less than one-fifth in the better eye. Hamburg and Leipzig do the same. Berlin has set the upper limit at a vision of one-third, which is certainly very extreme for the upper limit, and only under very unfavorable conditions justifies education in sight-saving schools. The sight of most of these children is in danger.

Altogether we have to postulate for "poor sight" an extreme lower limit of visual acuity of 1/50 with normal visual field, and extreme upper limit of one-third. The author has not been able to learn from the English and American literature what the practical limits are for sight-saving schools in those countries.

We divide the children with endangered sight into two groups: 1, those with a tendency to inflammation of the refracting media or severe diseases of the eye-grounds, 2, those with anomalies of refraction—hyperopia, astigmatism, and myopia—and those with asthenopia.

The diseases of the eye in the first group are chiefly: phlyctenular keratitis, interstitial keratitis, choroiditis, retinitis, and optic neuritis. Here the eye physician in charge alone decides

as to admission. These children are the hardest to manage, as every eye physician knows and as Irwin observes, because, with or without a permit, they play truant month after month. They may be sent to the sight-saving class for a certain period, if the present condition of the eyes does not allow of reading and writing to the extent necessary in the regular schools. After being cured, they may return to the regular schools.

As far as hyperopia and astigmatism are concerned the selection for the sight-saving class is very simple. All the children who after very careful correction (I have very often noticed a lack of attention in this matter) have not more than one-fourth to one-third vision belong to the sight-saving class. The same holds true for children with amblyopia and nystagmus without much error of refraction. Stricker pleads that far-sighted children with more than eight diopters or those with asthenopia and more than five diopters of error belong to the sight-saving class. I must disapprove of this because the visual acuity is the only important point. It has never been proved that far-sighted eyes are harmed in the regular schools.

Concerning myopia, opinions vary greatly, depending principally on how much influence close work and eye-strain are thought to have on the origin and progress of myopia. It is remarkable that in Germany, where the fear of "school myopia" was inaugurated by the investigation of H. Cohn, the ophthalmologists lay much less stress on this point than in other countries. Most German ophthalmologists now seem of the opinion that the onset of myopia can not be prevented, because it depends upon an hereditary factor, and that the children if carefully corrected can attend public schools without any harm.

Entirely different are the opinions in England and America. Here the sight-saving classes were founded for myopes. I do not find in the reports from the Anglo-Saxon countries any proof that avoidance of close work has prevented moderate myopia. Anyway, considering our uncertain knowledge as to the influence of close work, one should rather be overcautious and send to the sight-saving class a child who has an error of —8 diopters at the age of six years, especially if observation by an ophthalmologist has shown progression and if the child comes from a family with progressive myopia.

However skeptical one may be as to the influence of close work, it is very striking to encounter patients who acquired corneal scars in early childhood and were forced to hold objects very near. These patients very often become near-sighted, which is fortunate for them.

I cannot approve of the postulate of Stricker and Kerr that myopes with five diopters belong to the sight-saving class. If a myopia of five diopters turns out to be progressive in the regular school, the child can always be sent to a sight-saving class, but this should not be done as a rule, because the education in these special schools (at least in Germany) is designed for children with defective sight. These children are supposed to learn reading and writing of average-sized script and print if possible.

In England and America, myopes are taken care of in a way that is unknown in Germany. It can be understood why Kerr wants to have seven or eight per cent of the pupils in the regular schools sent to special classes, as even low degrees of myopia are thought to need special attention. But we cannot include these moderate degrees of myopia in the group of children with endangered sight.

The ophthalmologist is supposed to make the final decision. In order to establish some limit, I should like to consider the myopia of eight diopters as the border line unless changes in the eye grounds or other disturbances speak for transfer to a sight-saving class. The question of instruction of myopes ought to be discussed by all

ophthalmologists as to the principal problems concerning the influence of close work, of the wearing spectacles, and of heredity. I desire to plead for discussion of these questions first at national meetings and then at one of the international meetings.

From reading American and English literature about asthenopia I have received the impression that in these countries too much emphasis is laid upon complaints by some children as to fatigue and glare. These are nervous children, provided they are wearing the proper correction. These children should not be upheld in the belief that they have defective sight or real eye disease, by being taken to a sight-saving class. On the contrary, this idea should be removed by suggestion. An ophthalmologist or a neurologist should take charge of them.

Selection for the sight-saving class

I have pointed out which children belong to the sight-saving class, but as a matter of fact it is a difficult task to get hold of all these children. The school teachers usually pick them out first. The second examination is made by the school physician or by an eye physician. I think that the eye physician ought to make the second examination. He commonly has a great many children referred to him, but of those so referred he usually picks out only ten per cent for the sight-saving class, for the other ninety per cent can be sufficiently improved by glasses or are suffering from eye disorders which require attention.

In spite of this system of selection, a certain number of children are overlooked because of movements of population. The examination of children in the primary grades is not sufficient. Every new pupil should also be examined. It is very hard to get hold of children with endangered sight. They do not go to school regularly, the teacher scarcely knows of them. Unless they are watched very carefully by the school they fall into idle habits, do not learn anything; and they become a burden to the community and are usually placed in institutions for the blind in order to shift the responsibility on to the state. The eye physicians should take personal charge of these children. They ought to keep them under observation and to tell the parents about the special schools. Except in Saxony there is no legal regulation by which children with defective vision are compelled to attend sight-saving schools. Unquestionably legislation will be necessary to deal with this matter.

Everybody who is told about these sight-saving schools asks first: How can children with defective sight attend school safely? Experience has shown that they do get to school without being hurt. In Hamburg, the journey to school takes almost an hour, and no accident has yet been recorded. If necessary the cities must provide guides and free car fare as they do in London. The children very soon learn to find their way alone.

The inmates of institutions for the blind should also be reexamined. According to statements made at the last congress for the care of the blind, in Königsberg, in August, 1927, one-fifth of all inmates of institutions for the blind are not blind, but have defective sight. They belong, so far as the children are concerned, to a sight-saving class.

There is not sufficient reason for combining sight-saving schools with institutions for the blind. The state and the children gain if the latter are taken out of institutions for the blind. So far as I can find, only in Hamburg and Milwaukee are children with defective sight kept in institutions for the blind. These children should not be stamped as blind.

There is no doubt that the connection with institutions for the blind usually gives very good results from the fact that the teachers are especially interested and trained in this subject.

This, however, should be regarded

as only a makeshift, should be given up where it already exists, and should not be newly established. I object to special classes as additions to blind schools according to the decision of the congress for the blind in 1927. As a makeshift, however, the arrangement could be kept going until boarding schools were established for children with defective sight who lived in the country or in small cities. The children should get the idea of seeing and not being blind.

The state would have to support these children as it does the blind and cripples. It is more profitable for the state to support children with defective sight than blind children. At the present time we are far from the condition demanded by Irwin, namely, that every city with a population of 20,000 shall have its own sight-saving school. One of the reasons is the lack of trained teachers.

If our feelings do not urge us to found these schools, other motives may be found which are more impelling. Kerr says that more valuable members of society are developed in sight-saving schools than in institutions for the crippled and tuberculous. The practical American, thinking in terms of dollars, realizes that every community which does not establish sight-saving schools has to pay for the fact in dollars and cents in a loss of economic power. (Irwin.)

Fortunately, the German government is now interested in the matter. We hope that the government will see that all the forces and all the experiences acquired in various places are combined, that means of teaching are discussed and finally agreed upon. The city of Dortmund has granted money on a large scale which is at the disposal of ophthalmologists and school experts for the study of existing institutions.

The principal duties of the eye physician are to make the final selection for the sight-saving school, to see that the children with endangered sight are sent to these schools, and to keep track of all the students there. The physician who is in charge of a school should not treat the children himself, he should only decide when treatment is necessary and make the arrangements.

Summary

To sight-saving schools belong:

1. Children whose sight is defective because of stationary anomalies of the eye with a visual acuity within the limits 2/50 and 1/4.

   Children with 1/50 or 1/3 can be accepted under special conditions.

2. Children with endangered sight:

   a. Children with recurrent diseases of the anterior segment or with active conditions of the posterior segment of the eye. Some of these children should be taken into these schools temporarily, some permanently.

   b. Children with anomalies of refraction (children with hyperopia and astigmatism according to the visual limits given under 1).

   Myopes: Children who begin school with eight or more diopters of myopia. If there is a history of extreme myopia in the family, then even lower degrees of myopia may be taken in sight-saving schools. These children attend the sight-saving school only for subjects which involve special eye-strain.

Children with asthenopia and good visual acuity without progressive changes in the eye should be taught in regular schools and taken care of by ophthalmologists and neurologists. In the large cities the children with visual disturbances should be picked out first by the teachers and then referred to the school physicians. These make a second selection and turn the children over to the ophthalmologist who has to make the final decision.

Children with endangered sight should be referred to these schools by the eye physicians who are in charge of the case.

The state should support sight-saving schools just as it does institutions for the blind.

The subject should be discussed at national and later at international meetings, as soon as possible.

Bibliography

[1] (The following references are reproduced from the original article, although most of them relate to the historical division of the essay, here omitted.)
Nachrichten des westfälischen Blindenvereines, 1927, No. 32.
Niepel. Teaching methods of the sight-saving schools in Berlin. Department of Education, Berlin.
Wanecek. Die Wiener Sehschwachenschule und ihre Methode. Zeit. f. Augenh., 1927, v. 61, p. 251.
78te Versammlung deutscher Naturforscher und Aerzte, Stuttgart, Abteilung für Augenheilkunde.
Eos. Zeit. f. Heilpädag., 1927, No. 1, p. 20; 1926, No. 6, p. 177. Zeit. f. Augenh., 1927, v. 61, p. 451.
Hanke. Das Auge, Springer, 1927, Vienna.
Kerr. School vision and the myopic scholar. London, G. Allen and Unwin, Ltd., 1925.
Levinsohn. Arch. f. Ophth., 1907, v. 110, p. 52.
Irwin. Sight-saving classes in the public schools. Harvard bulletins in education, 1920, no. 7.
Herzog. Die Hilfschule, 1927, p. 20, p. 163.

WHO SHOULD REFRACT?

PETER MEYER
BUFFALO

(speaking for the Guild of Prescription Opticians of America)

The suggestion is made that the more than seven thousand eye physicians of the United States ought to be able to furnish adequate refraction service to the population of the country without delegating such work to opticians or optometrists who are not equipped to understand or diagnose medical conditions.

The Journal of the American Medical Association in its issue of December 15 printed an address by Dr. Walter B. Lancaster of Boston, given as chairman before the section on Ophthalmology of the American Medical Association at Minneapolis in June, 1928. The subject was "The optometry problem".

After a declaration of the need for adjusting policies to suit the conditions of the times, Dr. Lancaster says: "There is no problem confronting us today more difficult of solution than that of our relation to opticians and optometrists".

The author endeavors to discuss the problem in the interests of the three parties involved, the public, the optometrist, and the eye physician, in the order named.

Quite naturally, but little of the address is given over to the viewpoint of the public, because their interests in the problem are cared for by the other two parties. Dr. Lancaster remarks that to the public both the optometrist and the eye physician are necessities.

He further states, in his remarks regarding the question of the eye physician exclusively caring for the ocular needs of the public, that "the number of competent eye physicians is totally and hopelessly insufficient for any such program either now or at any time not too remote for consideration".

That statement has been made before by prominent eye physicians, and I consider it an unfortunate one, because it conveys a wrong impression of the actual situation.

Dr. Lancaster qualifies his statement by the reference to "competent eye physicians", from which it may

be inferred that some eye physicians are incompetent. But the same thing must be true of nonmedical eye examiners, and it is not to be imagined that there is a smaller percentage of incompetent ones among them than there is among the eye physicians.

So we have the question of a comparison of available material or facilities in the two types of eye service.

Over seven thousand physicians in the United States are equipped with trial cases and are listed as offering to examine eyes and to prescribe glasses, and in a greater or lesser degree they are considered to be eye physicians. The least that can be said in favor of them as a group is that in intelligence, knowledge, training, and experience they grade somewhat higher than the new kind of eye doctor which Dr. Lancaster seems prepared to recognize.

Seven thousand eye physicians, on three hundred days in a year, each examining the eyes of five patients per day, would serve ten million five hundred thousand persons. That surely does not look like totally and hopelessly insufficient facilities for giving medical eye service.

From the optometrists' viewpoint, Dr. Lancaster's address is fair in his commendation of their efforts to overcome their deficiencies and to elevate their standards. He recalls the vicissitudes of the dentists in their early attempts to assume a mutually satisfactory relationship with the medical profession.

Is it to be supposed that the spectacle-selling eye examiner will set up for himself a curriculum comparable in scope with that of modern dentistry, and involving a process of education which will entitle his calling to be embraced within and accepted as a branch of medical science?

Finally comes the viewpoint of the physicians, the nucleus of which as stated by Dr. Lancaster as follows: "The great obstacle to consultations between eye physicians and optometrists is commercialism. The practice of optometry is too much a matter of business. It must become a profession". "If as and when the optometrists organize a group of members who will set up professional standards and maintain them, consultations and cooperation will be welcomed by many eye physicians".

If the solution of the problem lies in the simple matter of eliminating commercialism from optometry, and if thereby it is possible to create a full-fledged profession cohesively attached to the science of medicine, the problem would seem after all to be one easy to solve.

But later comes an editorial in the December issue of the American Journal of Ophthalmology, signed with the initials of Dr. Edward Jackson and captioned "Training for ophthalmic practice", in which is expressed a quite different train of thought, a paragraph from which is here quoted:

"The general medical course should be taken by all who wish to treat the defects, diseases, and injuries of the eye. The eye is a part of the body, and lives, keeps health, and performs its functions through its connection with other parts of the body; suffers injury and disease from similar causes; and depends for restoration on the same vital processes. The attempt to create a profession of optometry, apart from medicine, has been as much a failure as attempts to manage diseases of the eye without any knowledge of its special function. But to attempt to split off a small part of medicine and combine it with optical knowledge, to furnish cheap treatment for eye conditions, is certain to fail of any good service to the public. Ophthalmic practice is a department of the general healing art; and will always be best carried on by those who have secured a fundamental education in general medicine".

While we Guild opticians are on the side lines in our observation of eye physician trend and thought, we see and hear enough to enable us to assimilate a picture of the situation which, while commercial in its outlook, is nevertheless very real and

true and perhaps more so than if it were inspired by an inside view of the subject.

There is a small group of eye physicians who have been (shall we say?) fortunate enough to attain a position wherein their work is principally surgery and consultations.

A few of these men have apparently lost their interest in refraction, and sometimes they seem willing to permit that part of medical practice to be eliminated from their personal program. Yet one would think they might be interested in having the work carried on by medically trained men.

There are some thousands of younger eye physicians who today occupy the same position these leaders once were in, when this work of refracting was the largest and most important part of their practices.

It is true, as Dr. Lancaster points out, that the nonmedical refractionist is here and must be considered. But there are some angles which he seems not to have considered in his effort to solve the problem.

In its propaganda, organized optometry has uniformly referred to the eye physician as an eye surgeon. Obviously the reason for this is a desire to make the public think of the eye physician only in terms of disease and surgery of the eye.

In the meantime the Guild of Prescription Opticians of America has adopted the title "eye physician". Unfortunately, Dr. Lancaster's suggestions fit into the optometrists' scheme more closely than into that of the Guild.

May not the solution of the problem lie in earnest cooperation on the part of eye physicians with the Guild, the membership of which is composed of opticians who have demonstrated that with such cooperation there is not much of a problem to be solved.

Incidentally, it may be mentioned that the Guild optician, as a business institution, has the right to propagate his opinion through advertising which is surely the most effective agency for educating the public to an appreciation of the safer eye service.

559 Main street.

NOTES, CASES, INSTRUMENTS

MYDRIASIS FROM JIMSON WEED SEED

JAMES M. PATTON, M.D., F.A.C.S.
OMAHA

Case 1: M. O., farmer, aged thirty-nine years, was referred to us February 3, 1928, with the history that the previous day, while he was clearing away some brush and dried weeds, a seed from a Jimson weed pod flew into his right eye. He was unable to remove it for several hours, and in the meantime he noticed that he could not see clearly with that eye.

On examination the vision was R.E. 20/40, L.E. 20/20. The right pupil was fully dilated, with no reaction to light. No irritation or trauma of conjunctiva or cornea. Media clear; fundus normal. No abnormality in extrinsic muscle movements, fields, or tension.

A solution of eserin sulphate 0.2 per cent was instilled, with slight reaction after an hour. Eserin solution was prescribed, and when he reported the next day the pupil was normal in size and reaction; vision 20/20-1, with return of accommodation.

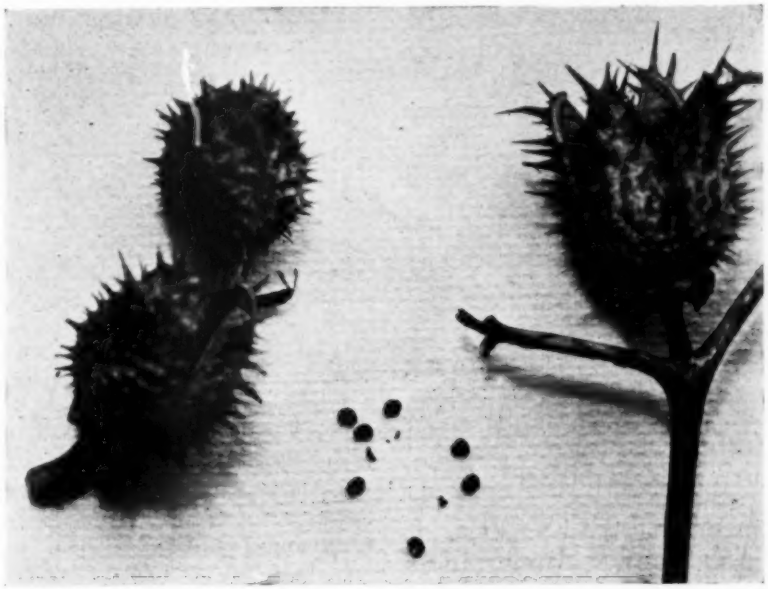
Diagnosis: Monocular mydriasis caused by the seed of a Jimson weed. (Datura stramonium).

As the patient was positive as to the character of the foreign body and as the action of stramonium is well known, there was no difficulty in establishing the cause of the mydriasis. In case two the history was not so clear.

Case 2: Mr. T. A. H., aged twenty-five years, connected with the con-

struction department of the local electric power company, was working on a transmission line near the Platte river. He consulted us December 20, 1928, stating that on returning from work the previous evening he had noticed that the close vision of his left eye was indistinct. He was working part of the time among tall, dry weeds and some time during the day got something in his eye, but as it caused little discomfort he paid no attention to it until he got home in the evening, when he removed a small, flat, black seed-like foreign body (1.5 mm. in size) from the inner canthus. At that time he noticed the dilated pupil and disturbed accommodation.

His vision was R.E. 20/15 and L.E. 20/20. Right eye normal except for small pterygium. Left eye conjunctiva moderately congested, media clear, fundus normal; pupil fully dilated, no reaction to light. There was no history of any other usual cause of monocular mydriasis, so, recalling case one, a tentative diagnosis of Jimson weed dilatation was made. A solution of eserin sulphate was prescribed and the patient was told to report. We asked him, if possible, to bring in a specimen of the weeds among which he had been working on the previous day. He returned two days later with the left pupil normal in size and reaction. Vision was 20/15 in the right eye, and he stated that his close vision had not troubled him since shortly before he began using the eserin. He had not been working at the same place but some time later he brought in a specimen of the seeds and pod (see figure) of Jimson weed among which he had been working, this confirming the diagnosis.



Mydriasis from Jimson weed seed (Patton). Seeds and dried pods of Jimson weed.

The plant in question, Datura stramonium, is variously known as Jimson weed, thorn apple, stinkweed, and so on. It is a coarse, branching weed two to six feet high; the leaves are large with irregular margins; the flowers are large, funnel-shaped, usually white, and are followed by prickly, globular, four-celled pods containing numerous small, black seeds. All parts of the plant have a disagreeable odor.

The plant (American Encyclopedia of Ophthalmology, volume 5, page 3750) contains daturin, atropin and

hyoscyamin, and its physiologic and toxic actions are practically identical with those of belladonna.

Unexplained monocular mydriasis is disconcerting, and the possibility of Jimson weed poisoning should be kept in mind while going over the history of the onset. The recovery of both cases reported was prompt and, except in cases of incipient glaucoma, the blurring will clear up in a few days without doing any harm. The weed is widely distributed throughout the United States; the seeds easily escape from the dried pods and may be thrown or blown into the conjunctival sac.

1620 Medical Arts building.

HIGH HYPERPHORIA WITH VIOLENT HEADACHE, CORRECTED BY TUCKING*

G. Oram Ring, M.D.
PHILADELPHIA

The refractive error of Miss L., aged thirty-eight years, in the right eye was a low mixed astigmatism and in the left eye a low hyperopic astigmatism. The error was complicated with a left hyperphoria of approximately fifteen degrees. There were no lesions of the eyeground, slit-lamp study was negative, and the corrected vision was normal in each eye. Insofar as the appearance of the eyes was concerned, the patient unless tired was able so nearly to control the muscular movements as to give little hint of the strain to which she was constantly being subjected in her effort to correlate her vertical, horizontal, and accommodative movements, that is to say to maintain bifoveal fixation and fusion.

It was not because of the slight cosmetic disquiet that she sought relief, but because of the devastating headache which followed almost any effort to live a life normal to a woman of her years. For example, when riding in an automobile she always preferred the back seat, and if she attempted to run the car herself the left eye was always kept closed. A shopping trip, a ride in a trolley or train, any effort at reading or indeed at doing any near work would be followed invariably by a pain beginning in the eye and running back to the occiput, and which was so severe as to compel her to retire to bed and remain there for from twenty-four to forty-eight hours, despite all ordinary efforts at its alleviation, until life had become a horror and chronic invalidism was threatened. The efforts at near work were especially associated with head tilting.

An effort, which extended through many months, to relieve her by means with which you are all familiar, and which included blood and urine studies, an exhaustive search for focal infections, careful sinus studies, the elimination of any associated menstrual disturbance, and, so far as I was personally concerned, repeated efforts to relieve her muscle tension by vertical prisms, all failed of their purpose.

Operation of any kind was viewed with extreme nervousness and perhaps with considerable distrust. An idea that could readily be followed by any woman, as adapting to the eye a procedure with which she was familiar in dressmaking affairs, and which she was assured could do no possible harm and would likely bring considerable relief, succeeeded in its appeal, and on April 20 of the present year, with Dr. Shannon's assistance, I applied Dr. Harrison's ingenious tucker to the left inferior rectus muscle. The operation was done under ether. General anesthesia is admittedly a handicap in that it precludes comparative study during the operative procedures, but in this instance it was the only possibility. At one stage of the operation we felt that we had overcorrected the defect, and we therefore slightly reduced the size of our tuck.

The final result was most satisfactory. Indeed, as the messenger

* Read before the Section on Ophthalmology of the College of Physicians of Philadelphia, December, 1928.

said of Claudio in "Much ado about nothing" it "bettered expectations". After a few weeks the deviation was less than one degree, indeed in a number of tests scarcely a half degree. The headaches are absolutely and I believe permanently cured.

An examination of the patient during the present week showed the lateral balance to be approximately as one to three, although each function was slightly under an average normal.

In a personal communication, Dr. Frank C. Parker wrote me that he had had no occasion to utilize the procedure on the vertical muscles, but that he saw no reason for not doing so should operative means be decided upon. Lentz has just finished for Dr. Parker a new tucker which he used a few days ago and finds advantageous. He has modified the Todd instrument so that the tucker arms are bent at a right angle, one arm having been made quite thick to allow of putting in the center a notch which facilitates the placing of the needle in the tuck stitch. One arm has been made shorter, so that now, with the difference in the size and shape of these two arms, there is less chance of confusion as to which arm slides beneath the muscle.

In the March, 1928, number of the American Journal of Ophthalmology, one month in advance of the article by Drs. Shannon and Harrison, Dr. Thomas J. Clemens of this city published a paper "an advancement operation without destruction of tissue", which consists of folding the tendon beneath the muscle against the sclera while advancing the posterior end of the fold to a point anterior to the original insertion.†

It will be recalled that Dr. Harrison's tucker was originally presented to this Section on January 19, 1928, in a paper by Dr. Shannon and himself entitled "An instrument for muscle tucking". It is my personal conviction that the tucking procedure has been so simplified by the Harrison instrument that this is likely to find increasing application to our muscle problems.

Northeast corner Walnut and Seventeenth streets.

† The Parker and Clemens tuckers were shown when this paper was read.

AMAUROSIS FUGAX AND THROMBOSIS*

WILBER F. SWETT, M.D.
SAN FRANCISCO

This case is reported because of the unusually excellent recovery of function which followed thrombosis of the left inferior temporal retinal artery with extensive retinal changes.

The patient, Mrs. M. B., housewife, forty-nine years of age, was first seen May 7, 1928. At this time she complained of periodic attacks of dimness of vision in the left eye starting about six months ago, but causing her no distress until two weeks ago. The vision failed at that time and remained very bad, so she became alarmed and was directed to the clinic.

The paroxysmal attacks of blindness limited to the one eye and followed by rapid recovery, but with gradually increasing severity, established this case as an amaurosis fugax of unusual intensity and rapid development.

Examination: Right eye: Vision 20/15; tension and visual fields normal; fundus and disc normal. The vessels showed a very slight arteriosclerosis which might have been easily overlooked had it not been so marked in the left eye.

Left eye: vision 15/200 intermittently, due to vitreous opacities and disturbance in the region of the fovea. The peripheral field was normal, but there was a relative central scotoma. Tension normal. The pupil reacted normally.

The background was very interesting. The temporal and lower halves of the disc were edematous, the edema extending well out into the macula

* From the department of ophthalmology, Stanford University medical school, San Francisco.

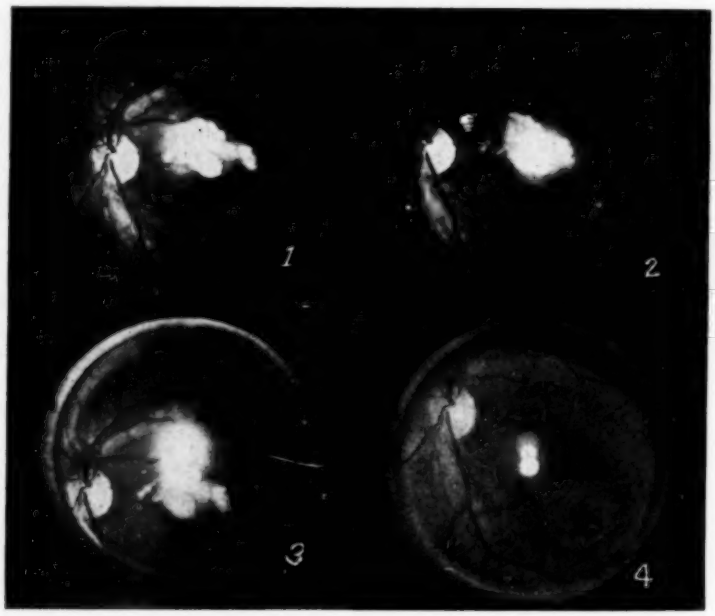
along the course of the inferior temporal artery. The artery itself was very attenuated, tortuous, and varicose in appearance; in fact, I had the impression that the vessel was in a state of spasm because it appeared to pulsate in several of its more dilated portions. There was no interruption of the blood column to be seen, but the edema in the macular region made this difficult to judge.

The general examination was normal except for a blood pressure of 200/130. Wassermann negative. A faint trace of albumen in the urine, but otherwise normal.

On May 8, the lesion had become more extensive, the vessel being thrombosed and the edema much more widespread. The superior temporal retinal artery showed early changes similar to those previously seen in the inferior, but not sufficient to result in any edema or fundus lesion. (No. 1.)

The thrombosis of the inferior retinal artery was due to persistence of the arterial spasm. Probably many of the so-called emboli of the central retinal artery are of this type, for any one examining this case on May 8 would have believed it to be such. If I had not been fortunate enough to have watched it develop I should have easily made the error. There was a central red area which could have passed for a "cherry-red" spot in the macula, although somewhat blurred by the edema.

May 14 the edema was appreciably less extensive but the arterial picture and function remained the same. (No. 2.) An examination on May 21 showed no change. June 1 the central scotoma was more definitely outlined, the vision became 20/200 clear, and the edema was considerably less, so that the details of the macula were more readily seen. (No. 3.)



Amaurosis fugax and thrombosis (Swett).

By June 14 most of the fundus lesion had entirely disappeared; in fact they could not be discovered unless one was well acquainted with the picture. The function, however, still remained 20/200. These conditions remained constant until November 8, at which time all trace of the lesion had disappeared and the function had returned rapidly to 20/30.

December 4 the vision was again

taken, and had improved to 20/20 partly. This has remained constant to date, and the last photograph was taken December 10, 1928, at which time the eye was practically normal. (No. 4.)

Throughout the whole period the blood pressure remained at about the same figures, and there was no return of the amaurosis fugax symptoms.

Arteriosclerosis is always interesting to study in its many and varied lesions, but this case has been particularly interesting because I had a chance to follow it from its incipient stage to the common climax and through to this unusual recovery.

The conclusions are that the thrombosed vessels canaliculized so rapidly that the ischemia was not prolonged sufficiently to result in permanent loss of function of the retina. There was without doubt a collateral circulation, but none was to be discovered in the photographs or by the ophthalmoscope, and the original vessel and branches are again functioning.

490 Post street.

MELANOSARCOMA OF CHOROID

L. L. McCoy, M.D.
SEATTLE

The patient was an Italian farmer aged sixty-six years, apparently in good health. His chief complaint was gradual loss of vision in his left eye starting about seven months previously. He said he had the sensation of a curtain slowly falling over his sight. He went to an optician one month after vision began to fail and was given glasses. He was told that there was a small lump in his left eye that would cause him no trouble. The patient gave a history of having been struck in the left eye by a limb from a tree while pruning his orchard one year before trouble commenced.

Examination: Vision, R. 20/70; L. hand movements below. Mild tearing, right and left. Moderate conjunctival congestion of lids. Tear sacs apparently normal. Corneas clear except for marked arcus senilis. Anterior chambers normal. Irides dark brown and appear normal. Right pupil normal. Left pupil semidilated and practically fixed. Lenses clear. Right fundus normal except for mild arteriosclerosis. Oblique illumination of left eye revealed an irregular dark-colored mass projecting into vitreous chamber from nasal side, apparently arising from choroid just posterior to ciliary body. With the ophthalmoscope the mass appeared rather irregular (nodular) projecting sufficiently into the vitreous to obscure the disc. The retina was seen to extend over the mass in a grayish haze. The rest of the fundus was normal. Transillumination showed the mass to be solid. Tension of the globe by touch was normal, the same in both eyes. There was very little question as to diagnosis, so enucleation at once was advised. Patient went home but returned the following day and was referred to Columbus Hospital for operation.

Melanosarcoma of choroid (McCoy).

March 29, 1928, enucleation of left eye under general anesthesia. Conjunctiva closed with silk purse-string suture. Patient dismissed from hospital March 30. Made a very uneventful recovery. April 28, 1928, artificial eye fitted. July 16, 1928, small polyp of granulation removed. The socket was in very good condition. September 22, 1928, mild conjunctival irritation with slight discharge. Astringent drops containing zinc sulphate were given. Patient apparently in good general condition. No evidence of recurrence or metastases thus far.

The specimen was sent to Major

George R. Callender, of the Army Medical Museum, Washington, D.C., who returned the following report: "A mushroom shaped melanotic mixed cell sarcoma arising to one side of the optic disc, projecting 1.5 cm. into posterior chamber. There is no apparent invasion of the sclera and, as you remember, the nerve was cut so short that it could not be examined independently".

817 Summit avenue.

SOCIETY PROCEEDINGS

EDITED BY DR. LAWRENCE T. POST

WILLS HOSPITAL CLINICAL CONFERENCE

November 2, 1928

DR. PONTIUS presiding

Cyst of iris

DR. J. MILTON GRISCOM exhibited a man showing a cyst of the iris, which had appeared after an injury to his eye about fourteen years ago. Three millimeters from the limbus there was a scar in the sclera adjacent to which was a multilocular cyst involving about one-quarter of the surface of the iris and projecting well forward into the anterior chamber. There was a secondary cataract occupying the pupillary area. This was divided with a knife needle and the cyst punctured, causing it to collapse. The tension rose after the operation, and an iridectomy was performed with removal of a part of the cyst wall. Dr. Griscom discussed the varieties of cyst of the iris, and classified the case shown as an inclusion cyst.

Complication following cataract extraction

DR. L. P. GLOVER, senior resident, presented a case from Dr. Griscom's service showing a rare complication following cataract extraction. The cataract was of the "complicated" variety, and at the time of operation there was considerable loss of semifluid vitreous. Twenty-four hours later, at the first dressing, the corneal flap was found to be turned inward with the upper margin projecting into the vitreous. A spatula was inserted beneath the flap and it was replaced in its proper position. Twenty-four hours later the anterior chamber was reformed and the convalescence was thereafter uneventful although somewhat prolonged. Dr. Glover had searched textbooks on ophthalmology but had found nothing referring to this complication.

Jensen's disease, juxtapapillary chorioretinitis

DR. MAURICE MARCOVE, junior resident, presented such a case from Dr. Paul J. Pontius' service. Glycosuria was the only pathological finding other than the eye lesion.

Relative value of common ocular antiseptics

DR. L. P. GLOVER said that for a considerable period of time there had been discussion as to the relative efficacy of mercurochrome, argyrol, protargol, silver, mercurophen, and boric acid in their power to free eyes of bacteria following a positive culture before operation. It had therefore been deemed advisable to run a series of tests to decide this. We had known of zinc sulphate as a specific for Morax-Axenfeld bacillus and optochin for the pneumococcus and of their poor germicidal power for other organisms, so they were not used in this series.

The method of determination for half the tests followed that reported by Simmons (Journal American Medical Association. September 8, 1928.) Cultures of staphylococcus albus and aureus and of pneumococcus were used, as being the common dangerous contaminants of the eye. It was impossible to follow closely or even approximately the action of the eye in

relation to any skin test or even culture test, because no drug remained long in the cul de sac, so the following methods were used. The organisms were plated in the form of a cross on blood agar. These cultures were allowed to grow one hour in order to receive a good start. In the center of the cross of bacteria a small four millimeter square of sterile gauze was placed and on this two drops of the material to be tested. This was allowed to grow for twenty-four hours, and then the destroyed area of growth was carefully measured along these lines and the total added to give the relative value of areas destroyed. This was shown by the charts. The strength of the bactericidal agents was as follows: mercurochrome 2 per cent; protargol 3 per cent; silver 1 per cent; mercurophen 1 to 5,000 solution; hexylresorcinol 1 to 3 dilution; argyrol 10 per cent; boric acid.

For the pneumococcus, mercurochrome two per cent was found best, with protargol three per cent a close second. For staphylococcus aureus, argyrol ten per cent was far the best, with mercurochrome two per cent second. For staphylococcus albus protargol three per cent was found best, with mercurochrome two per cent second.

A second series was run by a method thought to be original. The organisms used were on cultures of blood agar slants grown for five hours. Two drops of each solution was carefully placed on the growths and worked back and forth for two minutes, this being the length of time a disinfectant remains of any value in the eye. Following this, the various preparations were carefully washed out of the tube twice with sterile normal salt solution. The tubes were then incubated twenty-four hours and graded in accordance with the number of live colonies of bacteria remaining. The results were identical with the plate tests, showing the same relative germicidal power. In conclusion it was seen by these tests that only four preparations had much germicidal power in the eye, namely mercurochrome, argyrol, protargol, and silver.

Incipient optic atrophy

DR. THOMAS A. O'BRIEN presented a case in which the iris of one eye showed considerable degeneration. Argyll Robertson pupillary reaction together with a history of a primary lesion twenty-five years before pointed to lues as the basic cause.

Tuberculous keratitis

DR. LOUIS LEHRFELD exhibited a case of tuberculous keratitis from the clinic of Dr. Burton Chance. Phototherapy was the principal form of treatment. Ultraviolet rays from the Zeiss apparatus were used for three minute periods three times weekly. No attempt was made to measure exactly the angstrom units of the ultraviolet rays. Excellent results were obtained. There was a marked recession of symptoms, subjective, objective, and pathologic.

Partial embolus of retinal artery

DR. APPLEMAN told of a patient who had entered the hospital about three weeks ago, complaining of sudden failure of vision in the right eye three weeks previously; no pain or inflammatory symptoms were present. The left eye was not affected. He had never had a similar involvement. Examination of the right eye upon entrance showed conjunctiva moderately injected, pupil semidilated. There was a marked, widespread, triangular-shaped area of descemetitis below. The media showed numerous fine vitreous opacities; disc margins not well seen, due to swelling of the nerve head. There were many fine diffuse hemorrhages scattered throughout, especially below and temporally; a well marked star-shaped figure in the macula; the retina edematous, especially in the upper half. The left eye was negative. Vision O. D. was fingers at one foot, O.S. 20/20 plus. Urinary

examination was negative for albumen and sugar. Blood pressure was 90/50. Tension was normal to palpation. Meinicke was positive, three plus. After provocation neosalvarsan 0.6 gm., Meinicke was negative, and Wassermann negative. Nose and throat examination showed chronic tonsilitis; no sinus involvement. Dental examination showed two bad teeth. Treatment consisted of removal of tonsils and infected teeth, administration of neosalvarsan and potassium iodide, and mercury rubs, beside atropin instilled locally. The condition had improved, with regression of hemorrhages and of star figure in macula; the vitreous had become fairly clear; the descemetitis was seen only by means of the microscope; vision had improved to 20/70 plus 2; and the field had enlarged about ten degrees horizontally.

Dimitry gold ball implantations

Dr. Frank C. Parker presented two cases showing excellent motion of the prothesis and practically a normal appearance in contrast with the usual sunken-in appearance of the customary enucleation. These cases had been operated upon about three months previously. Dr. Parker stressed the fact that silk sutures and not catgut must be used, else the balls would invariably be extruded within a few days.

Retinitis pigmentosa

Drs. George Dublin, James Shipman, and F. H. Alder presented several cases which were probably examples of this disease.

Leucomatous corneas

Dr. Burton Chance exhibited a case of old, dense, leucomatous corneas which he had treated by thermophore and curette, with the result that the dense portions had been scraped away without inflammatory reaction following.

Frank C. Parker,
Secretary.

COLLEGE OF PHYSICIANS OF PHILADELPHIA

Section of Ophthalmology

November 15, 1928

Dr. C. E. G. Shannon, chairman

An improved retinoscope

Dr. George H. Cross, in exhibiting an improved retinoscope, read the short paper published in this Journal, 1929, February, page 122.

Circinate retinitis

Dr. Hunter W. Scarlett exhibited a case of circinate retinitis which had been observed for over eight months, during which time several changes were noted. The exudate had increased from a few discrete dots and two patches, until a serrated semicircle beyond the macula was formed. The patient's father, mother, and one sister had died of tuberculosis. The patient had first noticed a disturbance of vision one month before coming to the Bryn Mawr Hospital dispensary for glasses. Fuchs believed that circinate retinitis was due to a fibrous exudate into the retina, while De Wecker thought it was a fatty degeneration following hemorrhage.

Discussion. Dr. Zentmayer exhibited a photograph of the fundus of a typical circinate retinitis taken by Dr. Alfred Cowan. The condition was bilateral. The patient was a woman about sixty years of age. The physical examination was negative. Dr. Zentmayer stated that he knew of but two anatomical studies of circinate retinitis. The one usually quoted had been made by Amman in 1895. As this eye was the seat of pathology from other causes, some doubt had been cast upon the findings as far as they related to circinate retinitis. About two years ago, Morax had reported concerning the microscopic pathology of circinate retinitis as found in an eye removed for pigmented epithelioma of the iris. He had found far more microscopic changes than might be expected from the ophthalmoscopic changes.

The macular lesion was due to a vacuole formation affecting the inner nuclear and the outer reticular layers. The changes corresponding to the gross ophthalmoscopic picture of a circinate lesion were found to be analogous to the exudates in albuminuric retinitis. A few hemorrhages were found. The retinal vessels on the temporal side were sclerosed.

Aniridia

Dr. W. O. La Motte, of Wilmington, Delaware, (by invitation) reported the case of a white male, twenty-six years of age, who had first come to him in January, 1922, complaining of poor vision and frequent pains over his eyes. Vision O.D. was 6/60; O.S. 6/40. The patient was the oldest of seven children. One boy had died at twenty-four years of tuberculosis, one at twenty-six years of typhoid fever; the other children, with the father and mother, were living and well. There was no history of other eye trouble in the family.

The eyes then had been practically as now, with the exception of fewer corneal opacities, the latter now covering center of the left cornea and reducing the vision of that eye to 2/60. Vision of the right eye was now 6/50, and with —0.50 sph. +1.00 cyl. axis 120 degrees vision was 6/40+. The irises, as far as could be seen, were entirely absent. There were stellate cataracts in the posterior cortical areas. The eyegrounds were not seen satisfactorily, but no gross changes could be made out. The tension of each eye was 28 mm. There was a spontaneous horizontal nystagmus.

Prepapillary retinal vessel

Dr. John Siggens (by invitation) presented a case showing an anomalous retinal vessel which extended directly forward from the neighborhood of the disc into the vitreous for several millimeters, then by several turns upon itself returning to the retinal level.

Discussion. Dr. Chance, beside this one, recalled having seen only two other examples of this exceedingly rare anomaly. These vessels bore no relation to those sometimes seen with remnants of the canal of Cloquet.

Dr. Zentmayer recalled but one well-marked instance seen in a colored man in whom the appearance was that of a tightly-twisted, conical spiral. In most of the cases the vessel was sheathed with glial tissue giving off a brilliant reflex.

A case for diagnosis

Dr. Edward A. Shumway showed for diagnosis a case of supposed sarcoma of the neck, with double vision, in a healthy girl sixteen years of age. Six weeks before examination at the Oncological hospital, she had had a cold, with a bad sore throat, on recovering from which she noticed double vision and a lump appeared back of the right sternocleidomastoid muscle, which was tender to pressure. She had been seen by a prominent Philadelphia surgeon and a diagnosis of sarcoma of the neck was given.

Examination showed paresis of the left superior rectus muscle. (Later examinations showed the right inferior rectus muscle as the one involved; later blood examinations showed no myelocytes, but ten per cent of eosinophiles). The pupils were equal, responded actively, and showed marked hippus. The eye grounds were normal and the vision good. Examination by Dr. Off showed infected tonsils, but no sinus involvement. X-ray study by Dr. Newcomet showed no clouding of any of them. Neurological examination by Dr. Potts found reflexes, gait, station, and coordination entirely normal. There was a slight hypalgesia of the right half of the upper lip, probably due to recent extractions of teeth. Five teeth had been removed previous to admission, three of which showed root abscesses and one of them a large dentigerous cyst. The urine was normal, the Wassermann test negative, but the blood report (which was not entirely satisfactory) made

at the hospital showed 2,700,000 reds, 7,000 white corpuscles, and a differential count of fifty per cent myelocytes against thirty per cent neutrophiles and twenty per cent lymphocytes. This examination was to be repeated at another laboratory, as the findings were contradictory. Examination of the chest and abdomen were negative, and the spleen was not enlarged. The right side of the face was distinctly more prominent than the left, evidently partly due to asymmetry, and there was a difference of two millimeters in the anteroposterior positions of the two eyes.

The case was presented for diagnosis, with a tentative diagnosis of focal infection from the teeth and tonsils, which had resulted in enlargement of the postcervical glands and a nuclear disturbance of the branch of the third nerve supplying the inferior oblique muscle. The prognosis from such a diagnosis would be much better than from the diagnosis of sarcoma and metastasis to the nucleus at the floor of the fourth ventricle. Further reports would be made if subsequent blood examinations showed there was really an increase in myelocytes, which would make possible a diagnosis of myelogenous leukemia.

In closing, Dr. Shumway said, in answer to a question by Dr. Holloway that there was no involvement of the lacrimal gland, and that an x-ray of the chest had not been made as there seemed to be no indication for it.

Pressure atrophy molding of a generally contracted socket

DR. EDMUND B. SPAETH presented from Dr. Peter's service at the Graduate hospital a case of pressure atrophy molding of a generally contracted socket. The patient was a colored girl aged fifteen years, who had lost her eye when an infant. The socket was unable to retain a prothesis. Plastic reconstruction of the socket by Thiersch graft had been done. This had curled up after a period of four weeks into a light-brown-tinged, furrowed membrane.

A plaster of Paris skull-cap was suggested by Dr. Robert H. Ivy. Above the right eye two C-shaped arms were embedded in the skull cap. At the distal end of each arm a mold of gutta percha was forced into the socket, the arms (of German silver heavy wire) having sufficient spring to maintain pressure of this mold in the socket, against its posterior and superior walls. The mold had been in place for a month. It was expected to continue the wearing of this mold for at least three months, and the mold itself would be increased in size two or three times during this period. The last four weeks the pressure was to remain unchanged.

Discussion. DR. SPAETH mentioned a series of cases in which the same procedure had been carried out by him, with universally good results.

Retained hyaloid structure as cause of juvenile cataract

DR. WILLIAM ZENTMAYER said that the thought to record these cases came from recently hearing an essayist say that monocular cataract in young individuals was practically always due to trauma. The two cases of juvenile monocular cataract here reported, and one other which he recalled but whose record he had not been able to find, had a cause other than injury. All three were associated with and undoubtedly due to persistence of the central hyaloid artery.

A.C., boy twenty-one months old, was seen in 1894. A cast and a reflex from the pupil had been noted by his physician soon after birth. He was a healthy child. Examination showed a persistent hyaloid artery, blood bearing. In 1899 there was a practically complete cataract and, in 1903 the lens matter had undergone complete absorption and the retained hyaloid structure could again be seen extending forward. It bifurcated, one branch being attached to the posterior capsule of the lens and the other traced forward to the ora serrata, where it was lost.

The second patient was in the private practice of Dr. Posey, a boy who had been operated upon when two years old for cataract. A white reflex of the pupil had been present at birth. At the age of six years the child had been referred to Dr. Zentmayer by Dr. Swindells because of an esotropia which had developed. Examination of the eye showed a complete hyaloid artery extending from the remnants of the posterior capsule backward to the papilla.

How the absorption of the cataracts was brought about in the first case could only be conjectured. It had been shown by Mann and others that the remnants of the hyaloid structures sunk to the lower part of the vitreous and could always be brought into view of the biomicroscope by having the patient look strongly up or down and then bring the eyes into the primary position. There was probably the same tendency for the retained artery to fall, and this might make constant traction on the capsule and so cause it to rupture, possibly at the equator, permitting intracapsular access to the aqueous and consequent absorption of the lens matter.

The central hyaloid artery lay in a canal in the vitreous lined by a hyaline membrane, the canal of Cloquet. Only the posterior part of the artery had a cellular sheath, anterior to this it lay in the canal. The latter broadened out funnel-like. When the central hyaloid artery persisted throughout its whole length and continued to carry blood there was, according to Collins, a formation of fibrous tissue in the vitreous which was frequently associated with a defect of development of the posterior capsule of the lens. At first the lens substance in front of this membrane was clear, but in the course of time it become opaque. Collins stated that even when the lens matter clinically appeared clear, microscopically it might show changes which in many cases would cause the lens to become opaque if the eye had not been removed. Such eyes were usually undersized.

As these facts were obtained from eyes removed on suspicion of the condition being glioma, it was probable that with the aid of the biomicroscope and a wider knowledge of the developmental anomalies of the eye more instances of monocular cataract of this origin in the young would be met.

"Ophthalmiatria", a rare old treatise

Dr. Burton Chance exhibited a rare treatise on diseases of the eye published in Latin by Wm. Coward, M.D., in London, 1706, entitled "Ophthalmiatria". Coward was a candidate of the College of Physicians of London for many years and enjoyed the friendship of distinguished medical scientists of his day, but he had written much on philosophical and metaphysical subjects which had met with severe condemnation, even to that of the burning of his books by the common hangman, by order of the House of Commons. He had translated much from the Greek and Latin, and had turned some English poems into Latin. A number of the chapters in "Ophthalmiatria" had titles similar to those used today; but there seemed to be much doubt concerning those which we, in these modern times, would ascribe to cataract and to glaucoma.

One might conclude that, in the seventeenth and eighteenth centuries, diseases of the eye were attended to by physicians who had received distinct instruction in the observation of disease and in applying reasonable and satisfactory forms of treatment except as to the surgical. In the history of the founding of the great London eye hospitals in the following century, we learned that the surgical treatment of affections of the eye had been for many years in the hands of irregular practitioners, which no doubt was the case at the time of Coward, as there were few or no directions in "Ophthalmiatria".

Ring pigmentation of the cornea

DR. T. B. HOLLOWAY and DR. PERCE DE LONG reported a case of ring pigmentation of the cornea.

LEIGHTON F. APPLEMAN,
Clerk.

CHICAGO OPHTHALMOLOGICAL SOCIETY

November 19, 1928

DR. GEORGE FRANCIS SUKER, president

Glaucoma

DR. DWIGHT C. ORCUTT presented six cases of glaucoma.

DR. C. F. YERGER showed three cases, one of them in a taboparetic.

DR. L. BOTHMAN presented two cases after Elliot trephining. One was in a young woman aged thirty-eight years. She had a history of lues, with treatment. The other was in a woman of seventy-two years. Both cases showed a positive dark-light test. They were shown in conjunction with the paper presented by Dr. Kronfeld. (See below.)

Transplants in experimental endometriomas

DR. SIDNEY S. SCHOCHET read a paper on this subject.

Some clinical observations on levoglaucosan (Linksglaucosan) and amin-glaucosan

DRS. E. C. ELLETT and R. O. RYCHENER read a paper which will be published in this Journal.

Discussion. DR. HARRY GRADLE said it was very pleasing to have the evidence that Dr. Ellett presented so conclusively. It was more than gratifying to him because it coincided with his own experience. He had used glaucosan for more than two years. In his hands amin-glaucosan had proved useless; in the six cases in which it had been tried there had been no disposition to reduce the attack; in fact he was inclined to think that in one case the attack was aggravated. In one case the patient became delirious and remained so for three days; whether due to the glaucosan or not was doubtful. If the attack was fresh enough, so that adhesions had not been formed, adrenalin was of much greater value, and if the adhesions were just forming adrenalin in a large percentage of cases would reduce the hypertension, but it was in no sense a cure, it merely tided over. As to levoglaucosan, he had had better results with this. It brought the tension down. It was not a cure for simple glaucoma, it would not hold the tension down for any length of time, but it was of great value in carrying over the rough spots and bringing the eye into a condition of tension wherein miotics again become effective. It should be used where the tension was not controlled by pilocarpin. If the tension rose above the danger limit, levoglaucosan should be used to bring it down temporarily, but it alone was not enough, it must be followed by miotics immediately. One, two, three or four instillations of levoglaucosan might be used, followed by eserin until the pupil had contracted, then followed by pilocarpin. He had had disastrous results in two cases, one in 1926 and one this spring, in rather high tension cases of glaucoma simplex. An attack of acute inflammatory glaucoma had been precipitated by levoglaucosan, and in both cases iridectomy became necessary to control the hypertension. Nevertheless, in his opinion levoglaucosan could be used with a fair degree of safety and the assurance that something would be accomplished. It was of great value in breaking adhesions. It would induce stimulation of the sympathetic, and by the stimulation induce contraction of the dilatator fibers of the pupil.

DR. E. K. FINDLAY said it had been a pleasure to listen to so complete a description of glaucosan. Many of those present had hoped for a more favorable report of this new preparation in the treatment of glaucoma. Dr. Ellett's careful analysis of the results he had obtained in the use of

the drug would indicate, however, that levoglaucosan had little advantage over the usual miotic preparations. As a mydriatic it appeared to be more potent than atropin and for that reason its indiscriminate use in glaucoma might be attended with great danger.

Dr. Walter R. Parker (Ann Arbor, Michigan), said that his experience with the use of glaucosan in glaucoma had been exactly the same as Dr. Ellett's. He had not used levoglaucosan in iritis and was indebted to Dr. Ellett for bringing out this use of the drug so clearly. He had used levoglaucosan in eight cases of glaucoma, rather recent cases of the simple type, and in all but one the tension was temporarily reduced. In no case was further treatment and subsequent operation avoided. In one case an acute attack, not very violent, was precipitated. In each case the directions outlined in the original paper were followed. He had thought that there might be a favorable opportunity for operation after the use of levoglaucosan, and was ready to perform operation when the congestion returned and the symptoms were more severe than before the drug was used. Would Dr. Ellett consider it safe to operate just after the use of levo-glaucosan, or would it be better to wait, treating with miotics in the meanwhile?

Dr. William H. Wilder said his experience with glaucosan had been very limited. In the few cases in which he had used it he was not very much encouraged by the results obtained.

Dr. William Gamble thought that the attack against the problem of glaucoma by mechanical means, operative and by the use of miotics, had advanced as far as it could, and it might be by chemical or therapeutic methods that further advances would be made in the treatment of this disease.

Dr. Harry Woodruff had had no experience with glaucosan. Dr. Woodruff believed that Dr. Gradle erred in saying that atropin acted as a mydriatic only in a negative way, by paralyzing the sphincter of the iris. It also had a stimulating action on the dilating fibers, so it had a double action, and Dr. Gradle had no doubt often used powdered atropin to break up iritic adhesions.

Dr. Ellett, closing, said that he had had no experiences that would enable him to answer Dr. Parker's question. So far as he could remember, he had not operated on a case soon enough after the use of glaucosan to have noticed any ill effects from the drug so far as operation was concerned.

Modern viewpoints about the mechanism of glaucoma

Dr. Peter C. Kronfeld read a paper which will be published in this Journal.

Discussion. Dr. Woodruff remarked that there were many ideas as to the mechanics of glaucoma. Some of them disputed the hypothesis of inflow and outflow. The hypothesis of Henderson was one of these and attributed the tension to venous pressure. Mostly, however, one returned to the old hypothesis of Leber and its argument as to the filtration angle of the anterior chamber. In Dr. Kronfeld's sketch it was interesting to note the greater space available for inflow and the comparatively small area of outflow in the angle of the anterior chamber. When one looked at the enlarged microscopic specimen of the angle of the anterior chamber, one had little notion how small that area was—about one quarter millimeter in the widest part of the angle, so it would seem that the area was altogether too small to take care of elimination from the eye. There must be other places where this fluid found an outlet. Some experimenters had ligated the venæ vorticosæ and so produced a very marked increase in tension. On the other hand the pathological specimens in eyes which had been blinded from glaucoma very rarely showed any marked changes in the venæ vorticosæ—and so on

with the pros and cons of one hypothesis after another. The light and dark test in certain cases mentioned by Dr. Kronfeld brought to mind cases in which the tension of the eye seemed to be increased during sleep—the tension was found to be higher in the morning. Then the influence of the tonometer in reducing the tension of the normal eye and not reducing it in the glaucomatous eye brought to mind the value of massage after operation to restore circulation through the canal of Schlemm or through a fistulous opening. Massage also had some value on the glaucomatous eye even if it had not been operated on.

Dr. Georgiana Theobald said that most of the pathological material received in the laboratories was from cases so far advanced that its value in discussion would be slight. The Society was indebted to Dr. Kronfeld for the interesting and valuable slides she was showing. Specimen 1226 was from a woman forty-two years of age, who had had a typical history of rings around lights after being in the dark. During the daytime tension was 16, 17, or 18 mm. After being in a dark room for about an hour tension would increase to 60 mm. Visual field and optic nerve were normal. She had been killed in an accident, and in that way the eye was obtained. There was a rather shallow anterior chamber. It could be readily imagined that when the pupil dilated the thickened iris easily obstructed the angle of the anterior chamber and stopped the outflow of aqueous humor. The next slide, 1325, was from a female about sixty-five years of age. The other eye had shown early symptoms of glaucoma simplex, with nasal step and high tension. This eye was always quiet. Finally she came in with an acute glaucoma in this eye and on account of her weakened condition it was enucleated. There was a rather deep anterior chamber, but the root of the iris was up against the pectinate ligament, shutting off all drainage into the canal of Schlemm. The next specimen, 2200, was of acute hemorrhagic glaucoma. The anterior chamber was deep. The angle was closed. The synechiæ between iris and cornea were anterior to the pectinate ligament; the outflow was entirely occluded. The next slide, 4360, was from a case of glaucoma simplex. An iridectomy had been performed, but the wound was closed by connective tissue and the tension recurred. The anterior chamber was deep; the angle of the anterior chamber closed by the root of the iris, which was glued to the pectinate by plastic exudate.

Dr. Michael Goldenburg said that if the essayist agreed, as he apparently did, that the source of the aqueous was from the capillaries, then he must also agree that by the same process the aqueous might return to the blood stream. The phenomenon responsible for the inflow was also present for the outflow. In his comparison of the capillary surface available for inflow with the available surface for outflow of the canal of Schlemm, he ignored the fact that this same capillary surface for inflow was also available for outflow in addition to that of the canal of Schlemm. The ideas relative to the outflow through the canal of Schlemm were not based on proven facts, and it was questionable if the canal of Schlemm was the greater avenue of outflow. The speaker was more inclined to agree with Duke-Elder that equilibrium between the blood and the aqueous did exist, in other words that a reciprocal interchange was continually taking place. The fact that every element in the aqueous was found in the blood and that every element in the blood plasma was found in the aqueous must be significant. The normal aqueous differed from the aqueous in glaucoma. The permeability of the capillaries had been proven by Krogh, Fusita, Lewis, and others.

Dr. Kronfeld, closing, said that the title of his lecture was "Modern viewpoints about the mechanism of glau-

coma" and not "The theory of formation of the intraocular fluids in the normal eye". In his paper on the "Carbon dioxide content of the aqueous" he had given due credit to Duke-Elder, and he had always been in favor of the latter's hypothesis. He, however, thought that it had been proved that there was a certain amount of inflow in the glaucomatous eye. It might be that a normal eye did not have any. What he had tried to bring out was that it was not possible to differentiate between an inflow which was very little and an inflow which was zero. The question had been asked why the rôle played by the vessels of the iris was not considered. If there was a positive dark-light test with very little dilatation of the pupil, the surface of the iris had changed very little. The increase of tension did not correspond to the small change of resorbing surface of the iris, and it would therefore seem that the outflow through the iris was very little.

ROBERT VON DER HEYDT,
Secretary.

SAN FRANCISCO COUNTY MEDICAL SOCIETY

Eye, Ear, Nose, and Throat Section

November 27, 1928

DR. WALLACE B. SMITH, chairman.

Siderosis

DR. H. GORDON SMITH presented a case of siderosis appearing within four days after injury.

Discussion. DR. F. H. RODENBAUGH suggested that the reason for quick siderosis was the solubility of ferric oxide or rust, which apparently was the foreign body which had penetrated into the eye.

DR. W. E. CHAMBERLAIN explained why foreign bodies were sometimes not demonstrated by x-ray. These reasons were: (1) The bodies might not be of sufficiently great atomic density to cast a shadow. (2) The focal spot of the x-ray tube might be too large. (3) The body might be so tiny that even the very fine focal spot which was used in this work would be too large to cast a distinct shadow. (4) The eyeball might move during the exposure so as to blur the foreign body shadow.

Sarcoma of the iris

DR. OTTO BARKAN presented a case of sarcoma of the iris.

Discussion. DR. RODENBAUGH spoke of the possibilities of cure through the use of radiological principles.

DR. W. E. CHAMBERLAIN said that, while he had never treated a case of this sort, he believed the best chance in a purely local neoplasm was by the use of a large single dose. As to the type of radiation, he did not feel he could advise between x-ray and radium.

DR. F. C. CORDES spoke of the good results he had seen with radium on external malignancies of the conjunctiva and cornea, using the radium in a bare tube. He thought radium should be tried in this case. In regard to the production of glaucoma by radium he had observed this in only a few cases where massive doses of radium were used, as in the treatment of rodent ulcer of the nose.

DR. H. BARKAN called attention to the presence of glaucoma in this case, and discussed its etiology.

The Toti-Mosher operation on the lacrimal sac

DR. ROBERT C. MARTIN and DR. F. C. CORDES presented a paper on this subject. Dr. Martin outlined the procedures and the steps taken by the rhinologist in performing his part of the operation. He then showed several patients on whom this operation had been performed.

DR. FREDERICK C. CORDES said that, while dacryocystectomy did give relief in suppurative dacryocystitis, there was present at times an epiphora that was annoying. The Toti-Mosher operation, in properly selected cases, gave excellent results, and from the patient's point of view far superior results to extirpation of the sac.

There were certain contraindications to the operation. For obvious reasons there must be no stricture between the punctum and the sac. It was also desirable not to slit the canaliculi. In cases where cleaning up a lacrimal sac infection was preliminary to a cataract extraction, the Toti-Mosher operation was contraindicated. Suppurative dacryocystitis of long standing was no contraindication. In one of the patients operated upon, a chronic suppurative process had been present for eight years. Early postoperative lavage of the canal through into the nose was important in that it kept the canal clean and prevented possible adhesions around the opening into the nose.

The operation had been done thirteen times with but one failure. In this case, the bony resection did not extend high enough. With one exception the remainder had been kept under observation and had remained free from symptoms. The results had been sufficiently good to warrant the belief that in properly selected cases the Toti-Mosher was the operation of choice.

Discussion. DR. HANS BARKAN felt that relief from epiphora could also be expected after a Meller operation.

DR. KASPAR PISCHEL reported on a case of intranasal dacryocystectomy. He pointed out the advantages of the intranasal operation, especially the transseptal modification, according to Kofler, thus avoiding any external scar.

DR. OTTO BARKAN reported on the good results of several Toti-Mosher operations done in Sweden.

DR. WALLACE SMITH spoke on the history of the West operation.

D. K. PISCHEL,
Secretary.

NEW ENGLAND OPHTHALMOLOGICAL SOCIETY

December 18, 1928

DR. S. J. BEACH presiding

Encapsulated intraocular foreign body

DR. J. HERBERT WAITE presented a patient who two years previously had received a chip of case-hardened steel in the right eye, revealed by x-ray twenty-four millimeters back, four millimeters above, and one and a half millimeters nasally to the axis. The ocular media remained clear, so that slow encapsulation could be watched. The vision was then 20/20. Above the disc an acute-angled object with a metallic luster could be seen. Repeated attempts to dislodge the body by magnet were made unsuccessfully by the surgeon on duty. The patient was discharged, and told to keep in touch with the clinic. About four weeks ago the foreign body became encased within a mound-like mass of white tissue. X-ray now showed the shadow of the same size and in exactly the same position. There was now no evidence of siderosis of the globe and the ocular media were still clear. The vision, however, had fallen to finger counting at several feet, perhaps best accounted for by traction upon the retina.

Discussion. DR. W. LIEBMANN told of a similar case, showing near the nerve head a foreign body, which he was able gradually to loosen and pull away with the aid of a small needle probe. Dr. Liebmann wished to know why posterior route extraction was not attempted.

DR. J. H. WAITE mentioned the danger of infection and of detachment of the retina.

DR. E. B. DUNPHY said that he had tried the giant magnet about twenty times when the patient first came in and that he felt that it was dangerous to enter the globe.

DR. G. S. DERBY felt that Dr. Dunphy was justified in not attempting a posterior route extraction in this particular case.

Case of corectopia

DR. PAUL CHANDLER showed a case of corectopia in a girl aged eight and one-half years, the right pupil displaced about 1.51 mm. up and out; the left displaced 1.5 mm. down and out. Iris structure in both eyes was nor-

mal except for an area three millimeters in diameter in the upper outer quadrant of the left eye, where it was very thin and pigment epithelium could be seen shining through. Vision was 20/20 in each eye and the eyes were normal in all other respects. There was no other eye trouble in the family.

Pigmented spot on iris

DR. PAUL CHANDLER showed a woman aged twenty-seven years, who had noticed a brown spot on the iris following an injury ten years ago. It had not increased in size. The pupil was over three millimeters in diameter and drawn slightly in the direction of the pigmented area at the right lower sector. The spot was five millimeters broad at the periphery, narrowing to 1.5 mm. at the pupil, and it was slightly elevated, appearing to curve over the pupillary margin to the back of the iris.

Tumor of the iris

DR. BENJAMIN SACHS presented a young man twenty-four years old who had a growth of the left eye. The patient had noticed a black spot in his eye a few months previously and thought that it had increased in size. The tumor was brownish black in color and measured three millimeters in width, five millimeters in length, and about 1.5 mm. in depth. It was intimately connected with the iris stroma and was situated near the root of the iris. The pupil was not involved and the ciliary body and choroid also seemed normal. The vision was 20/20. It was probably either a melanoma or a melanosarcoma.

Discussion. DR. G. S. DERBY suggested doing a diagnostic iridectomy and removal of the tumor. If immediate microscopic examination proved it to be of a very malignant type the eye should be enucleated.

DR. ALLEN GREENWOOD felt that it would be dangerous to do an iridectomy because the tumor could not be removed totally. His suggestion was to try radiation and keep the patient under observation. The tumor extended pretty far back into the anterior chamber and it probably involved the root of the iris. He had once seen such an eye rapidly fill up with tumor growth followed by melanosis of the conjunctiva of the lids. Fortunately radium destroyed all of those foci of melanotic infection and the patient did not die as a result of general melanosis. In that case, as soon as the diagnosis was made the eye should have been enucleated.

Carcinoma of optic nerve

DR. THEODORE TERRY presented a case (Dr. Dunphy's patient) that had appeared at necropsy to show tuberculous involvement of lungs, liver, kidneys, spleen, thoracic and abdominal lymph nodes, meninges, midbrain, and fourth ventricle floor, but proved under the microscope to be carcinomatous, probably originating in the lung. The sections of optic chiasm showed almost complete replacement of nerve fibers by carcinomatous infiltration, with some infitration to a point within ten millimeters of the globe. There was a layer of carcinoma cells on piaarachnoid on one side of the nerve over a distance of four millimeters some eight millimeters behind the eye. The carcinomatous areas showed large cells of irregular size. There were numerous mitotic figures. No areas of necrosis were found. The intravaginal space was abnormally large, suggestive of some increased intracranial pressure. The disc showed no papilledema. Choroidal metastases were not found. However, additional sections which were now being prepared might show them. It was quite probable that the blindness was due to destruction of nerve fibers in the optic nerve by the rapidly growing carcinoma.

Two authentic cases of metastatic carcinoma of the optic nerve had been found in the literature. Behr's case (Klin. M. f. Augenh., 1922, v. 69, pp. 788-799), showed a fungiform swelling of the disc and independent

choroidal metastasis, verified by necropsy. Ginsberg's case (Klin. M. f. Augenh., 1922, v. 48, p. 309) showed carcinomatous nodules in each optic nerve near the chiasm. This growth was primary in a large bronchus. Cords (Deut. ophth. Gesell., 1922, p. 293) had reported a case of carcinoma of the pia with involvement of the intravaginal space.

Discussion. DR. ALLEN GREENWOOD stated that the process was not necessarily primary in the lung, but that the metastatic carcinoma of the choroid did not occur until the lung was involved.

DR. G. S. DERBY felt that perhaps not all realized how extremely rare this case was. It seemed that such sudden complete loss of vision could not be explained by the rapid growth of the tumor making the patient absolutely blind in the course of twelve days. There must have been something else to cause this.

DR. TERRY suggested that the nerve was probably involved before the patient was conscious of any visual disturbance. Pressure could not be the cause of blindness in this case, because intracranial pressure could not have been extremely high and there were no metastases of the meninges or brain that could have given such a pressure phenomenon. Therefore the most plausible explanation of the blindness was actual involvement of the optic nerves by the rapidly growing carcinoma. When Dr. Dunphy had first seen the case it looked like a picture of retrobulbar neuritis and he could see no other cause for blindness.

Metastatic orbital tumor

DR. H. F. HILL reported a rare case of orbital tumor, metastatic from the adrenal gland, in a boy four years old, of only two weeks duration according to the history. Beneath the normal conjunctiva, between the inner canthus and the globe, and inferior to the internal rectus, was a firm, slightly movable mass, apparently attached deep in the orbit. It had a vascular appearance, was not compressible, and had pushed the lower lid out several millimeters. Muscle movements of this eye were limited. Fundus examination was normal. X-ray and physical examination were negative.

The mass was removed in what appeared to be a capsule. It extended nearly one inch into the orbit and was about one-half inch in diameter. It did not seem to be attached to any of the solid structures and was dissected away easily. The frozen-section diagnosis was "round cell sarcoma". Dr. Verhoeff examined a specimen sent to him and reported "extremely malignant and undifferentiated tumor, probably a neuroblastoma metastatic from the adrenal". He suggested exenteration and radium, but the parents refused.

The case was followed by Dr. Mcquillan on the hospital service, and three months later he reported a palpable mass in the region of the right kidney. X-ray of the lungs was negative. Three months later the patient died. The doctor in attendance reported death due to pulmonary hemorrhage. No autopsy was obtained.

Sporothrix infection of lid

DR. HILL also reported a sporothrix infection of the lid unsuccessfully treated nearly three years. There were only seven cases of proven sporothrix infection about the eyes reported from this country and thirty-two from all sources, mostly French. The nearest clinical picture to this case was one reported by Woodruff, in which an encapsulated abscess from the lid showed branched threads in a section of the wall of the abscess. The lymphatics were not involved in either case.

The subject of this report was a man of twenty-eight years seen nearly three years ago in regard to a nodule on his right upper lid. There had been a round hard mass the size of a small pea on this lid for eighteen months. A year previously it had been opened and curetted by the

family physician. It promptly healed but the mass slowly grew larger. Examination showed an indurated area the size of an almond, four millimeters above the edge of the lid and extending under the brow. The skin was freely movable over it, except for one point where a small healed scar was fast to the growth. The edges were irregular and spread out into the surrounding tissue. It was firmly attached to the tarsus. Wassermann was negative.

Removal of the mass was attempted and it was freed from the tarsus. Most of the tissue was firm, with one encapsulated jelly-like mass. The first pathological report was "giant cell sarcoma". Dr. Mallory, from a section, gave the report of "giant cell inflammatory tissue from a fungus growth". This was confirmed as "sporothrix" by Dr. Verhoeff, who later procured fresh specimens and at one time succeeded in growing a culture.

During the past two years the mass had extended laterally well beneath the skin, infiltrating to the outer canthus, and breaking through the tarsus near this point to form a fistula into the conjunctival sac; this in spite of large doses of potassium iodide (30 gtt. t.i.d.). Several times the potassium iodide had to be stopped temporarily because a rash and illness due to the drug.

X-ray treatments seemed to aid at one time and then to fail utterly. Locally, iodine and gentian violet had been used, the latter injected into the masses. From time to time the larger lesions had been removed when they increased in spite of treatment. Gifford said it was gratifying to make a positive diagnosis of sporothrix as these cases would rapidly clear up under potassium iodide. This was not Dr. Hill's experience. The latest development had been a large solid mass firmly adherent to the lower rim of the orbit on the outer third, about the size of a large bean. X-ray showed no break in the bony contour. The mass at the outer canthus and on the upper lid had slowly decreased in size.

S. J. Beach,
Secretary.

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FUNDAMENTALS IN OPHTHALMOLOGY

Wide areas of scattered population and long distances between medical centers have been obstacles to the graduate teaching of ophthalmology in America. The tradition against attempting to specialize until after experience in the general practice of medicine has favored the development of a predominating interest in clinical work. But when this interest has developed and has become fixed by years of practice in isolated communities, it is more difficult to become interested in, and to pay enough attention to, studies that are fundamental to modern ophthalmic practice.

A few in the early years of practice may give up growing incomes and travel thousands of miles in America, or cross the ocean to work in the European laboratories of anatomy, physiology, optics, or pathology. A still smaller number may maintain private laboratories of histology for themselves, or may join with the local pathologist of a small city to hire a technician and to keep up work in histopathology; or with a trial case and home-made apparatus may cultivate study of physiologic optics. But often the fundamental branches of ophthalmic study have been neglected; so that lack of acquaintance with them has become all too common among American ophthalmologists.

The courses in histopathology given by Professor Fuchs called attention to a possible remedy for this. In Houston, Texas, a city of 150,000 inhabitants, Fuchs gathered a class of almost one hundred ophthalmologists; many of whom had left their practice for a period of two or three weeks and had travelled hundreds of miles to hear him. The classes he drew together in other medical centers were largely made up of such experienced practitioners, who had lacked fundamental training in pathology and had known no way of obtaining it. The visit of Professor John Parsons to the Pacific Coast Oto-ophthalmological Society, and the lectures he gave during his visit, disclosed the same general desire for fundamental training. Of the lectures and conferences given in the section on instruction of the American Academy of Ophthalmology

and Otolaryngology for the last seven years, many have been devoted to fundamental ophthalmology; and the general and continued interest in them shows that opportunities to learn of these topics are widely sought and appreciated. These Academy lectures have also shown that there are American teachers who can give adequate instruction in these fundamentals.

To gather a class worthy of Professor Fuchs and properly compensate him for such a teaching course, a wide region had to be drawn upon and many of his hearers had to leave their homes and practices and meet both necessary expense and loss of time. But such fundamental training can be brought to many parts of America without subjecting the graduate student to much loss of time or expense for travel. In the last year lectures on physiologic optics and on the practical application of its fundamental principles have been given in four widely separated cities of the United States. The ten lectures in this course were heard by ophthalmologists none of whom had to leave home or practice in order to avail themselves of the opportunity.

The plan offered for this one branch is capable of application to other branches. In every city where a few, say ten, ophthalmologists desire to pursue this kind of graduate study, a local society or committee can make the necessary arrangements. The anatomy of the eye and related parts, visual physiology, ocular histopathology, the neurology of vision, the biomicroscopy of the eye, fundus photography, the pathology and symptoms of particular diseases or classes of disease, ocular therapeutics and operative methods and technique could all be taught on this plan. Any ambitious, energetic young man, willing to master a certain limited field in ophthalmology and to prepare himself for teaching what he has learned, can open for himself a field of professional development and success, without the backing of any institution or personal support.

Such broad opportunity is certain to develop a larger number of capable teachers, and it will be open to many who have not the command of large clinics. Institutional clinics have done much for the graduate teaching of clinical ophthalmology; but good instruction in fundamental ophthalmology has been difficult to obtain. Today the opportunity for such study seems to be in the hands of those who need it, who can profit by it, and through whom it can afford a wide public benefit. The courses furnished by the Academy, and the demonstration sessions at meetings of other national societies, give opportunity for teachers to show what they have to offer, and for prospective students to choose teachers by whose instruction they feel they can profit. A committee for the purpose could arrange such itineraries as would reduce the expenses of the lectures, and make their courses practicable for smaller groups, in isolated places. The desire for such courses certainly exists, and will become more evident as graduate teaching of this kind develops.

Edward Jackson.

OPTOMETRY AS A PROFESSION?

Recently in one of our medical societies a distinguished ophthalmologist asserted that, it being out of the question to eliminate the optometrist, his trade must become a profession and himself be imbued with a "professional spirit." Once this state of affairs was reached a friendly spirit of cooperation was recommended as between the optometrist and the ophthalmologist, the former referring to the latter patients who suffered from miscellaneous eye conditions, while the ophthalmologist in turn was to refer patients to the optometrist for refraction work. For solution of the difficult problems of training the speaker advocated the same principles as had been applied to the dental profession, with which physicians cooperate on cordial terms. But it was thought not feasible to give the op-

tometrist a training which would make him competent in eye diseases, because for this purpose his education would have to be very similar to that of the eye physician.

In the present writer's opinion there is no close similarity between the evolution of the dental specialist and that of the optometrist. The dentist has now a complete training in his own specialty, and his first two or three years of instruction are similar to those of the physician. He practically covers his own field and very rarely has to refer his patient to an oral surgeon. When he fills a cavity, makes a bridge or a plate, or treats a case of pyorrhea, the patient has the full benefit of a complete training and the treatments are final. With the optometrist the situation is altogether different. His optical or optometric training does not enable him to discover the many diseases which threaten the health and efficiency of the eye, particularly glaucoma, retinal and choroidal diseases, macular degenerations, and nerve lesions such as beginning atrophy or toxic amblyopia. Yet to overlook the beginning of glaucoma, for example, is to invite disaster for the patient.

The legal sanction of this new "profession" has been mostly due to the erroneous belief, spread by interested parties, that the fitting of glasses is only a mechanical problem; that the optical system of the eye is independent of its other structures and derangements, and that the optometrist deals only with healthy eyes. According to this idea refractive errors are not diseases, but merely mechanical deviations from normal conditions. Nobody better than the ophthalmologist knows the fallacy of this opinion, and it is important that he should oppose and try to defeat this error and make it clear to legislators and the public at large that myopia, hypermetropia, astigmatism, and presbyopia are local disorders which in the case of the myopic are frequently accompanied by serious disease in the choroid and retina, and in the case of hypermetropia and astigmatism often produce general nervous symptoms such as are not always relieved by a pair of glasses.

Even if glasses are the only treatment necessary, the optometrist at his best is not in a position to prescribe an accurate correction. On the one hand he can not use mydriatics for paralyzing the accommodation, whose activity so frequently interferes with a satisfactory test; while on the other hand the general physical and psychological condition of the patient, his nervousness, his eye fatigue, and in some cases his reluctance or active opposition to the wearing of glasses, put him beyond the limited resources of the optometrist.

The position of the optometrist in the medical field can be better compared with that of the pharmacist than with that of the dentist. When a customer in a drug store asks for medicine to alleviate cough or gastric distress, he is frequently given some palliative which may or may not relieve the symptom. If the pharmacist were to be allowed to examine the patient's lungs and abdomen and give adequate treatment based on etiology, he would have to possess a complete medical education. Everybody would be shocked at the suggestion that the pharmacist ought to acquire a medical training which would enable him to deal adequately with these cases. Yet almost nobody seems to be surprised at the claim that the optician shall be entitled to apply his insufficient knowledge to the treatment of ocular disorders.

From the standpoint of public welfare and convenience complete training of the optician is necessary, in order to secure conscientious and effective service.

The schools of optometry in New York state have a new curriculum which greatly improves the standard of efficiency of their graduates. But, after obtaining his diploma from the best possible curriculum, the optometrist would need to become a professional man; that is, he would have to

be guided in his practice by a professional spirit. He would require a code of ethics similar to that which rules the medical fraternity.

The optometrist of today is primarily a merchant. His business is to sell glasses. That is why he opens a store and buys merchandise and advertises. The professional optometrist of tomorrow would have to be different. He would need to charge a fee for his services to the patient, and would have to avoid selling glasses himself. All this would require a complete reeducation of the public, which now is accustomed to go to the optometrist primarily to get a so-called "free" examination. Furthermore, the professional optometrist, under the plan which is here criticized, would need always to subordinate business to the good of the patient, and to refer to the eye physician any case in which he was unable to make a diagnosis or in which glasses did not sufficiently improve the acuity of vision. Certainly he should never, in such cases, prescribe weak spherical or cylindrical lenses simply to make a sale.

As suggested by Post (editorial in this Journal, October, 1928, page 819), it should be greatly to the advantage of the public, as well as of the medical profession, for a practical knowledge of refraction and of the fitting of glasses to be given to undergraduate medical students, adapting if necessary their medical curriculum to that purpose. *M. Uribe Troncoso.*

THE ETIOLOGY OF OCULAR DISEASE

An important percentage of the cases that come into the hands of the oculist present ocular conditions that require extensive physical and laboratory examination in the endeavor to determine their etiology. In a well-conducted ophthalmological clinic, such systematic investigations run a relatively routine course, so that within a fairly short time the ophthalmic surgeon is in a position to order the removal of such offending foci as may have been found or to class the case as "cryptogenic" and to order treatment according to his previous experience.

In private practice, the situation is more difficult. The thorough physical, roentgenological, and laboratory examinations so necessary involve an expense that to the average "white-collar" man is apt to be more than embarrassing. To expedite matters, and also to eliminate all avoidable expense to the patient, it is the writer's habit to hospitalize these cases. Upon admission, an "etiology sheet" is attached to the hospital record, and the interne on service is instructed as to which examinations are to be made and what laboratory and x-ray work is to be done.

The lines of investigation mentioned on this etiology sheet, and from which the specific instructions to the interne are selected, include the following: Nose: inspection, x-ray of sinuses, suction. Throat: inspection, tonsils, bacterial content of secretion. Teeth: inspection, x-ray of teeth. Ears: inspection. Thyroid: inspection, basal metabolic rate. Chest: physical examination, x-ray of chest. Abdomen: inspection, palpation. Genitals: male: external inspection, prostate, bacterial content of secretion; female: external inspection, condition of cervix, bacterial content of secretion, ovarian abnormalities. Joints, inspection. Blood pressure (including time taken). Urine, single and twenty-four specimens: albumen, sugar, casts, indican. Blood: time taken, red blood corpuscles, white blood corpuscles, hemoglobin, polymorphonuclears, large mononuclears, lymphocytes, eosinophiles, Wassermann, Kahn, indicanemia, blood chemistry. Spinal: Wassermann, Lange, gold colloid. Pirquet: plus or minus. Gonococcal complement fixation: plus or minus.

Needless to say, if suggestive evidence is found and further investigation is desired, staff specialists are called in consultation or are requested

Condition*	Percentages 1923	1924	1925	1926	1927	1928	Ave.
Iritis	1.3	0.7	1.7	1.2	1.1	1.6	1.25
Cyclitis	0.2	0.2	0.4	0.3	0.3	1.2	0.45
Vitreous disturbances	1.5	0.6	0.4	0.2	0.7	1.0	0.73
Retinitis	2.6	2.7	3.0	4.8	3.9	2.6	3.25
Choroiditis	5.3	6.1	5.5	3.4	3.3	4.0	4.60
Optic nerve disease	1.9	1.4	1.7	1.4	1.2	1.5	1.51
							Total 11.79

* To these might very well be added, for the corresponding years,
Cataract 9.4% 10.7% 11.3% 11.2% 10.5% 12.9% average 11.00%

to eliminate such offending foci as may have been found.

What cases need such investigations? About twelve per cent of all pathological conditions seen in private practice. The accompanying table is taken from the statistics of new patients seen by the writer during the past six years. The figures represent the ratios of individual conditions to the total of all pathological conditions diagnosed in new patients, regardless of the total number of patients and regardless of the incidence of the respective diseases among old patients.

From these figures it can be seen that 11.79 per cent of all the pathological conditions (excluding cataract), seen in an average private office practice need investigation as to etiology. Such etiological search is best conducted in a hospital, both for thoroughness and for economic reasons. If some definite record, similar to the one above outlined, be utilized, the investigation becomes simpler and offending foci are less likely to be overlooked. *Harry S. Gradle.*

SIGHT-SAVING CLASSES

The article by Bartels on the question of which children should attend sight-saving classes (see page 387 of this issue of the American Journal of Ophthalmology) is of international interest to all concerned with this new phase of specialized education.

Dr. Bartels states that he did not have recent information as to the American classes. The honor of initiating such classes in the United States belongs to Mr. Edward E. Allen, who has so much difficulty in fitting into a school intended for blind children pupils with seriously defective vision, that he learned with great satisfaction of the classes for myopes established in England in 1908. In 1909 he made a survey of these classes, and in April, 1913, he persuaded the board of education of Boston, Massachusetts, to establish the first sight-saving class in America. He did a great deal of work in preparing the teacher, Miss Helen L. Smith, and Perkins Institute, of which Mrs. Allen was and is the director, was most generous in making special material available. In September, 1913, the second such class in the United States was opened in Cleveland, Ohio, under the direction of Mr. Robert B. Irwin, who had learned of the experiment from Mr. Allen. To Mr. Irwin belongs the credit of further developing the idea.

There seems to be a good deal of controversy as to the expediency of placing myopic children in these classes, unless they have a very high degree of myopia, because of possible loss by their not attending the regular grades. There need be no such loss.

It is possible that this difficulty might arise in countries where such children are segregated in special schools, but it is not likely in America. The first class was necessarily segregated because there was no opportunity of placing it in a school where the children might attend the

regular grades. However, at the present time the great majority of classes in America use the cooperative method, by which children do all their close eye work in the special room under a trained teacher, with special equipment, books in large type, and so on, and go into the regular grade for all oral work, singing by rote, and general school activities, taking all of these with children of their own mental age. They participate in all school enterprises that will not prove detrimental to their sight, and are thus identified with the regular school system. It is fitting that this should be, since they are normal children in all but sight. The regular school curriculum is used, the method of teaching it being adapted by specially trained teachers. Instead of losing by not attending the regular grade for all their work, they are, in fact, gainers, as with the small number in such special classes more individual instruction is possible.

Ophthalmologists all over the country are steadily becoming more interested in sight-saving classes. The important requisite is to place the children needing this type of special education in the classes before it is too late to do much for them. Thus, if a myope of four diopters shows an alarming tendency to progression, it would seem advisable to place him in such a class, since under these special methods he loses nothing of his education, nothing of his social contact, but derives the benefit of individual instruction, with the equipment and hygienic supervision adapted to his needs. Many ophthalmologists of large experience believe that such special school care may be made a real influence in preventing or retarding progress of the myopia.

Winifred Hathaway, associate director National Society for the Prevention of Blindness

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Erratum

In the report of the meeting of the Pittsburgh Ophthalmological Society of November 19, 1928, on page 221 of the March issue of this Journal, the case of foreign body in the lens attributed to Dr. E. B. Heckel should have been attributed to Dr. Edward Stieren.

BOOK NOTICES

American Academy of Ophthalmology and Otolaryngology, transactions of the thirty-third annual meeting, 1928. Editor Clarence Loeb. cloth octavo, 622 pages, illustrated. Chicago, published by the Academy, 1929.

This is the largest annual volume the Academy has published, being almost exactly the same size as the volume published ten years ago, for the two annual meetings, 1917 and 1918. Of the 395 pages devoted to scientific proceedings, 212 are given to ophthalmology, and 72 to matters concerned with both specialties. The lists of members, officers, index, and so on occupy 150 pages. Such lists are scarcely noticed, unless one needs to consult them, when their value is apparent; but they add greatly to the labor of preparing such a volume. It is now eleven years since these transactions were first published under the editorial supervision of Dr. Clarence Loeb. He should feel pride and satisfaction in the greatly increased value of the series under his editorship.

There are several important bibliographies in this volume, one of them occupying almost twelve pages. These require special care in their publication, but they add much to the value of the volume as a work of reference. The 146 new members elected to the Academy at this meeting are an evidence of the expanding reputation of this organization and its transactions. A leading feature of this volume is the symposium on recent development in neurology as it applies to the eye, ear, nose, and throat.

That the Academy is contributing its share to scientific advance through

original research appears from the reports on the cultivation of lens epithelium in vitro; on the formation of the aqueous humor, its relation to intraocular and vascular pressures; on light therapy in ophthalmology; on ultraviolet light in prevention of infections; and on control of the activity of ciliated epithelium. In connection with such contributions to scientific progress, it should be noted that the Academy has accumulated a fund of $75,000 to assist in scientific research; and that the Committee on Ophthalmic and Otolaryngologic Pathology reported a total of 3,777 specimens, contributed in the last eight years to the collection in the Army Medical Museum. In some instances medical journals are replacing scientific transactions; but the possessor of this series has an excellent foundation for his library of books relating to his special branches of medicine. *Edward Jackson.*

The practice of refraction. W. Stewart Duke-Elder, D.Sc., M.D., F.R.C.S. Cloth, small octavo, 424 pages, 208 illustrations. London, J. and A. Churchill. Philadelphia, P. Blakiston's Son and Company. 1928.

It is especially appropriate that this book "printed in Great Britain," and written by a member of the staffs of the Royal London Ophthalmic Hospital, St. George's Hospital and Medical School, and the University of London, should also be put out with an American imprint. The American reader can recognize in it the advanced point of view and ideas that are characteristic of the American literature of this subject, but have not been broadly recognized by British authors and are mostly excluded from the literature of Germany.

The title of the book is almost an "Americanism." When recognition of the broad importance of anomalies of ocular refraction led to writing about the subject of "refraction" as it was the custom to write about "medicine" and "surgery," and when some authors wrote of "refracting" a patient, such a perversion of the word, from its former use to indicate breaking or change of direction of the rays of light passing from one medium into another, brought protest on the part of some. It was regarded as an unjustified corruption of the English language. Now the title of this book may be regarded as an acceptance of the inevitable—as an example of the changes which common use makes in the meaning of old words.

This book also shows the acceptance of ideas which have been developed chiefly in America, and which are more important than using an old word in a new sense. The second chapter, on eye-strain, gives rational recognition to the medical aspect of anomalies of ocular refraction and ocular movements; an aspect which Donders noted, but which was only appreciated after the aggressive emphasis placed upon it by Weir Mitchell, G. M. Gould, and George T. Stevens, all Americans. Some American readers may find the views of Duane, Gould, Stevens and Savage better presented in this volume than in any American textbook.

This book is arranged in six sections: I, Introductory, has two chapters, on vision and on eye-strain. II, Refraction, chapters 3 to 10, takes up principles, refraction of the eye, anomalies of refraction, and changes in refraction. III, Accommodation and convergence, in four chapters, considers physiologic accommodation, convergence, presbyopia and anomalies of accommodation. IV, The muscle balance, has chapters on orthophoria, heterophoria, and heterotropia. V, Clinical methods, has chapters on ophthalmological examination, visual acuity, ophthalmoscopic examination, retinoscopy, subjective testing of the refraction, and the testing of the muscular equilibrium. Chapter VI takes up the making and fitting of spectacles. In addition to these sections there are six appendices and a nine-page index.

The above outline of the plan and contents indicates that this book is written from a viewpoint somewhat different from that commonly taken by writers on refraction. On this account it will be of value to those already engaged in the practice. To the student it will be welcome because the principles of refraction are explained by diagrams rather than by algebraic formulas. But resort to diagrams makes it important that they shall be correct, and some of the diagrams here used seem to have been prepared by one who was not sufficiently conscious of the relations of the sines of the angles of incidence and refraction to the indexes of refraction of the media. An errata slip correcting figure 5 has been supplied with the book; but figures 2, 4, and 10 also need correction. In general the illustrations are appropriate, accurate, and well planned.

The wording of the text makes it clear, suggestive, and accurate. It must not be supposed that the recognition of American ideas has been attended with neglect of what has been written in Europe. The work of Maddox and of Worth has received the attention deserved, in contrast with failure to mention it adequately in much European literature.

The chapter on subjective verification of the refraction and testing of muscular equilibrium goes more fully into these matters than any earlier account of them. An excellent description is given of the use of the crossed cylinder for testing the amount of astigmatism. But there is no reference to its use as the best means of determining the principal meridians of astigmatism; although a good deal of space is given the "duochrome" test. The chapter on the making and fitting of spectacles, fifty pages, gives information usually not given to the oculist, but which should be possessed by every one who undertakes to prescribe spectacles. In this, as in many other points, the author has shown a broader, higher, and more accurate understanding of the scope and importance of the service that spectacles can render the human eye than have the writers on "refraction" that preceded him. *Edward Jackson.*

The Journal of the Egyptian Medical Association, historical number, volume 11, December, 1928. Cairo.

This special issue of the Journal of the Egyptian Medical Association is mentioned here because it constitutes a document of special value and interest in the history of medicine, and to some extent in the history of ophthalmology.

Ancient Egypt has been considered the mother of civilizations, and much of the learning and art of ancient Greece had an Egyptian basis. Pliny speaks of the Egyptians as priding themselves on being the pioneers of medical knowledge.

In this historical number an essay of seventy-two pages is devoted to a review of "Medicine in the land of the Pharaohs." The essay passes in review the vague medical Egypt of prehistoric centuries long before Christ; the Alexandrian school with which is associated the name of Ptolemy the third, one of the heirs of Alexander the Great; and the European medical renaissance, including the Gundishabur school, the Bagdad school, and the Andalusian school.

From the earliest times eye diseases and their remedies have played a prominent part in Egyptian and Arabian medicine. Thus, in the four hundredth year of the Mohammedan era, Omar El-Mouseli, a moslem who practised medicine in Cairo, wrote an important book on the treatment of eye diseases; while another work on the same subject came from an oculist named Ali-ibn-Isa, a Christian of Bagdad. All the known works of Galen and Hippocrates were translated into Arabic. Cairo became an important center of Arabic thought.

The modern history of medicine in Egypt has been bound up with the political vicissitudes through which

that country has passed since Napoleon's invasion. In 1827 Mohammed Ali Pasha, "the creator of modern Egypt," supported a movement for the establishent of a modern medical school, to which were admitted "one hundred students of the youths who were cognizant of Arabic."

Chiefly the books of French medical writers were utilized, and many such works were translated into Arabic. The medical school was later transferred to Cairo, where, in December of last year was laid the foundation stone for an ambitious new hospital and medical college designed along the lines of Egyptian architecture by a firm of London architects.

During the more recent British occupation or protectorate of Egypt, English language and English medical influences have naturally been important factors. For some time past the first two years of medical teaching in Cairo have been accepted by the Royal Colleges of Physicians and Surgeons of London. It is significant of changing conditions in lands where the Turk formerly ruled and where the Mohammedan religion prevails that women are allowed to pursue their medical studies on an equal footing with men.

El Mazny Bey reviews the oft-told story of Egypt's ophthalmic hospitals, first made possible by a donation from Sir Ernest Cassel, and very successfully organized by MacCallan. *W. H. Crisp.*

Wege zur Bestimmung des Scheitelbrechwerts von Brillengläsern. (How to determine the vertex refraction of spectacle lenses.) Rudolf Alt. 21 pages illustrated. Paper 2.20 marks. 1928, Verlag von S. Karger, Berlin.

Usually the optician fills the prescription for lenses given by the ophthalmologist from their position in the trial frame. Hence arise, especially for stronger convex lenses, e.g. cataract glasses, errors which interfere with the accuracy of the determination. In order to enable the ophthalmologist independently, without an intermediary calculating optician to transform the lenses of the trial frame into an equivalent combination for the desired distance, Alt, from calculations propounded with mathematical formulas in the theoretical part of this discourse, has devised a simple chart which is described and reproduced.

The table consists of twenty-five lines, one millimeter distant from each other (the middle thickness of the glass), parallel to the base, which is divided into sections according to dioptrics. The lines are cut by oblique lines ascending at an angle of forty-five degrees upward and to the left from the base. One reads the required dioptric measurement on the base, ascends along the oblique line to the parallel corresponding to the central thickness of the glass, and projects the point of this intersection on to the base, where the actual refractive value is indicated.

C. Zimmermann.

Lehre von den Gesichtsempfindungen, auf Grund hinterlassener Aufzeichnungen (Theories of visual sensations, on the basis of posthumous notes). Franz Hillebrand. 205 pages with 40 illustrations in the text. Price, unbound, 14.00 marks. 1929, Julius Springer, Vienna.

The intention of Franz Hillebrand, whose life work was mainly devoted to experimental investigations on normal sensations, to collect his observations in a comprehensive treatise on visual sensations in the scope of a general psychology was frustrated by his untimely death. To preserve the results of his researches during an indefatigable activity of more than thirty years, of which only a minor part was published, was the incentive for his wife, his pupil and collaborator within the last ten years, to edit the present volume on the doctrine of visual sensations. It is based on the carefully prepared papers for the courses of his lectures, on un-

published addresses, notes, and so on. References to former publications of the author and to opposing views are appended in italics to the single chapters by the editor.

The first part, on light sense, discusses the dependence of color sensation upon stimulation; the variables of color sensation, as shade, luminosity, and saturation; methods and laws of light mixture; dependence of color sensation upon excitability, adaptation and contrast; disturbances of color sense; origin and problems of color theories; and the Young-Helmholtz and Hering theories.

The second part, on sense of space, deals with real and visual space, correct and incorrect localization. localization by the eye at rest, primitive conception of space; correspondence of the retinæ, the horopter, vision with disparate points of the retina, empiric motives for localization, then localization on movements of the eye, nativism and empirism with respective arguments, criticism of empirism followed by a chronological bibliography of the publications of the late author, and an index. The elaborate work will be read with great interest and benefit. *C. Zimmermann.*

CORRESPONDENCE

A complete optometric diagnosis

(NOTE: For the benefit of foreign readers who may struggle vainly with the dictionaries, it should be explained that the enclosure to the following letter is published as a joke.)

To the editor:

I am enclosing a copy of a letter which a patient brought to the clinic this week. Her correction after cycloplegic examination was plus 0.62 spheres. Otherwise the diagnosis was "convergence insufficiency" with a very little hyperphoria. If you consider the copy of special interest to the readers of the American Journal of Ophthalmology, I can think of no reason why you should not use it. Personally I learned that there were several terms in ophthalmology which I had not yet mastered, and also that there were some of the principles of the science which had not yet come to my attention.

C. W. Rutherford.

Iowa City.

"This is a very complicated case. We find that her Convergence Acamadation relationship is so terribly locked that it is impossible for her to wear a proper correction for her Hyperoptic Astigmatic correction. We also find that she is wearing a cylinder correction with the rule and the ophthalmometer shows that it is against the rule proving that there is a spasm of the ciliary.

"It will be necessary to furnish her with several pair of treatment lenses to get her eyes in shape. To take full correction in addition it will be necessary to train her eyes, to unlock her acamadation, build up her aduction and her fusional reserve. Added to this is a bad case of Suspennosia. Her eyes have a very marked influence on her general health, and it is most important that she should attend to them. This training with the assistance of medical attention will work wonders in her case, and it will be necessary for her to do it sooner or later."

Refraction misfits

To the editor:

Your editorial "Vexations of refraction work" suggests the following comment. In the successful correction of refractive errors science, psyche and common sense must kiss each other. Frequently after several weeks of ultrascientific examination the patient is unable to wear the lenses prescribed.

Intelligentsia will when trial frames are put on with a dark disc in front of one eye say they can not read a letter on the card, but read twenty-twentieths as soon as it is explained that only one eye is tested at a time. Further, after trying out the correction several times in the office with

satisfaction they get the glasses and in a few moments decide they don't suit at all.

A number of years ago Dr. Edward Jackson in an editorial ably summarized the causes of asthenopia but failed to mention what I call "school and college eyes." For example, the three oldest of my eight children in local schools were always complaining of headaches; frequently examining them with and without cycloplegics they were told their eyes were normal and they needed no glasses. No sooner had they gone to schools near Washington and Baltimore than I was urged by the principals to let them consult oculists in those cities. The result was that in October they were all given weak lenses, and on returning home in December the glasses had been lost and none have worn any since. Without any professional fees this experience cost about $125 and the other five going away later on have been carefully forewarned. I have saved parents hundreds of dollars by explaining the school eyes complex, and if weak lenses are given they are justified as psychic placebos.

It is of great importance that the frames for the lenses ordered fit properly. It seems a truism to say that the pupils should be in the center of the lenses and that the frames ought to sit securely almost vertically, slanting slightly toward the face below, and yet a critical observer will see on the majority of people wearing glasses, and in newsprint pictures of notables, absurd misfits (for instance Dr. Ewing's glasses in March, 1929, issue of the Journal).

It is remarkable the number of prominent oculists who order or permit bifocal lenses which people cannot use comfortably because the near segment is too low. Patients from Boston and Chicago a few weeks ago consulted me unable to wear bifocals of this kind recently prescribed and furnished by fashionable oculists and opticians. They were easily convinced that the lenses were all right and the frames all wrong.

Zylonite skull-temple spectacles are now generally worn, the temples being joined to the lens rims on the outer canthus level. Now the top of the auricle is always at least one-eighth of an inch higher than the canthus and often a half to three-quarters of an inch higher, making it difficult to make the frames fit. A casual observer will notice on most people that the temples go obliquely up instead of horizontally and the lenses are tilted entirely too much toward the face below, the result being optically and cosmetically bad. By making the temple attachment to the rims an eighth or a quarter of an inch higher the number of ludicrously misfitting spectacles, that defy elementary principles, could be reduced.

Edward F. Parker.
Charleston, South Carolina.

OBITUARY

James Moores Ball

Dr. Lawrence T. Post writes:

Dr. James Moores Ball was born in West Union, Iowa, on September 4, 1863, and died at his home in Saint Louis on March 1, 1929. He was graduated in medicine from the university of Iowa and continued his studies in the United States and in Europe. His medical interests were catholic and his contributions exceeded by far those of most men.

Teaching occupied much of his time as a young man, he having been professor of ophthalmology in the old College of Physicians and Surgeons in Saint Louis.

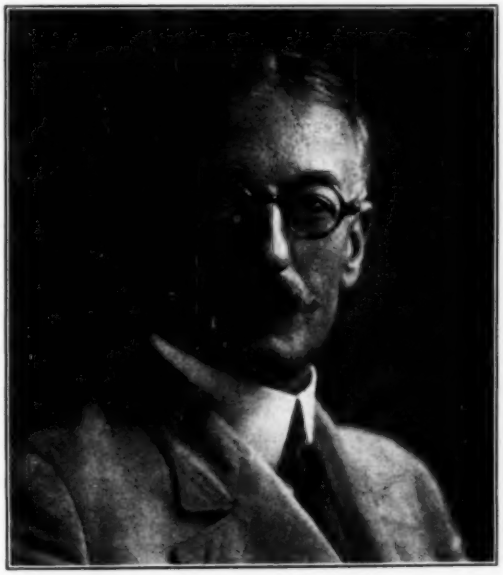
Undoubtedly he was best known because of his "Modern ophthalmology", an excellent and comprehensive textbook which went through many editions. Countless hours were spent in the compilation of this work and it was a subject dear to his heart. He was wont to speak of it affectionately as "the book", and it was hard to interest him in other things at such times as the publishers were demanding a new edition.

Early in his work the historical side of medicine appealed to him, and his studies made him an authority on this subject and enabled him to enrich medical literature by such contributions as "Andreas Vesalius, reformer of anatomy", published for private distribution in 1910, and "The sack-'em-up men" published in 1928. An almost completed work "Art and anatomists" was occupying his attention at the time of his death.

As a natural outgrowth of his love for antiquity he developed a taste for collecting books and specimens related to ophthalmology. He donated his extremely valuable collection of ophthalmological material to the Army Medical Museum in Washington, where it is now housed in a room known as the James Moores Ball room, devoted entirely to this purpose. Books, charts, specimens, plates, letters and autographs fill this room.

Rare old books were his especial hobby, and he donated several hundred of these to the Saint Louis Medical Society shortly before his death. Among his greatest pleasures was to gather together a few friends at his home, and to show them these books and to discuss medical subjects, of which his historical knowledge was astonishing.

He received many honors during his life but of these I believe he valued most his election as an honorary member of the Ophthalmological Society of the United Kingdom.



James Moores Ball, 1863-1929

He will be missed by the many whom he aided as a physician and by the ophthalmological profession in which he occupied a most unusually loved and honored place.

ABSTRACT DEPARTMENT

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is only mentioned in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases, including parasites
18. Hygiene, sociology, education and history

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3. PHYSIOLOGIC OPTICS, REFRACTION, AND COLOR VISION

Carlo, E. **Monocular perception of depth and consequences thereof.** Ann. d'Ocul. 1929, v. 165, Jan., pp. 24-32.

This is a preliminary report in which the conclusion is reached that depth perception may be either binocular or monocular and that convergence is merely to assure unity of sensation in binocular vision. The extension of the laws of physical and mathematical optics to vision is a delusion for various reasons cited by the author, among them being the necessary enlargement and reversal of the object as reproduced on the retina. Vision in its entirety is the sum of multiple perceptions thanks to which impressions are seized and interpreted to a certain extent. *Lawrence Post.*

Cattaneo, D. **Mechanism of accommodation.** Ann. d'Ocul., 1929, v. 165, Jan., pp. 32-52.

This is a very interesting report of slit-lamp observations on five cases in which some of the fibers of the zonula could be observed. In all cases eserin and accommodation acted alike in producing relaxation of the fibers and oscillation of the lens. In the only case in which the ciliary processes could be seen they were obviously advanced in accommodation. The zonular fibers were attached apparently near the base of the processes and posteriorly, so that their attachments could not be seen. No membrane could be made out. There was a diminution in the equatorial diameter of the crystalline lens and a serrated appearance of the periphery of the lens during accommodation, suggesting unequal contraction of the lens substance. Atropin acted more vigorously than eserin, overcoming its effect. In the relaxed eye atropin did not produce any visible change in the zonula. *Lawrence Post.*

Maddox, E. E. **Frame fitting by photography.** Brit. Jour. Ophth., 1929, v. 13, Feb., p. 60.

With the cooperation of Messrs. Curry and Paxton the author has perfected a camera and a method for obtaining a life-sized photograph which can be used as an index for the fitting of glasses. The apparatus includes a scale meshed in one-millimeter squares, with a vertical line down the center of the patient's nose, and the position of cornea, pupils, and visual axes in relation to this line or

to the horizontal meridian is clearly recorded. The photograph thus secured affords an opportunity of studying the best position in placing lenses before the eyes. In relation to the fitting of bifocal lenses, small segments of transparent celluloid are placed over the finished photograph so that the most satisfactory size and position can be studied. (Three illustrations.)

D. F. Harbridge.

Noiszewsky, K. **Accommodation for distance in myopes.** Klin. Oczna., 1928, Oct., pp. 129-133.

In high myopia the circular fibers of the ciliary muscle may not be present at all, but its meridional part, according to recent investigations of E. Fuchs, is always well developed. These longitudinal fibers constitute the tensor chorioideæ, and when contracting they may pull both the choroid and the retina forward, thus accommodating the eye for distance. A similar type of accommodation has been established in comparative physiology regarding the micromata. Some mathematical calculations are adduced to prove that a slight displacement of the retina is sufficient to accommodate the eye for considerable distance. *M. Beigelman.*

Rizzo, A. **Proposed apparatus for measurement of the visual base line.** Ann. di Ottal., 1928, v. 56, Nov., p. 1019.

The common method of measuring the intrapupillary space and then adding a couple of millimeters for distance is not satisfactory when the patient is highly ametropic. The lens centers should correspond with great exactitude to the visual line. The author has devised a method by which the base line can be determined. Using a simple apparatus across which a graduated bar passes, the patient obtains parallelism of the visual lines by looking into infinity. The distance on the bar between these lines is then recorded. This gives a line parallel to the base line, which is then easily determined by the known similar values of equal triangles.

Park Lewis.

4. OCULAR MOVEMENTS

Agnello, F. **Unilateral and double sixth nerve paralysis consecutive to cranial traumatism.** Riv. Oto-Neuro-Oft., 1928, v. 5, May-June, pp. 220-227.

The author describes two cases of isolated traumatic paralysis of the abducens, one of which was unilateral, the right abducens being affected. Fracture of the base of the skull is the more frequent cause of these paralyses. Isolated lesions of the abducens may occur with no symptoms of cerebral concussion, and in these cases, if resulting from direct or indirect cranial traumatism, the lesion is to be located in the mesial plane of the cranial base and principally at the apex of the petrous portion of the temporal bone. (Bibliography.)

M. Lombardo.

5. CONJUNCTIVA

Adamantiadis, D. **A case of malignant hyperplastic conjunctivitis.** Ann. d'Ocul., 1929, v. 165, Jan., pp. 53-58.

A poorly nourished seventeen year old girl who had suffered from nasal blocking, with a crusty thickening of the nasal mucous membrane and vocal cords, was attacked by a pseudomembranous palpebral conjunctivitis with marked thickening of the lids. This rapidly spread to the bulbar conjunctiva, with symblepharon formation and entropion. Shortly afterward the cornea became infiltrated, vascularized, and then xerotic. The second eye rapidly followed the first. Blood Wassermanns were always negative but, the spinal fluid being slightly positive, antiluetic treatments were used. After the first course of treatments and an entropion operation on one eye the condition improved temporarily, but it soon relapsed. Tuberculin treatment was tried, but rapid advance in the disease ensued. Tis-

sue sections showed only hyperplasia; no eosinophilia. A diphtheroid organism was cultivated from the membrane. Two rabbits died without obvious lesions following incubation with the organisms. The author was unable to arrive at a satisfactory conclusion as to the cause of the disease.

Lawrence Post.

Bursuk, G. **On the possibility of creating experimental gonoblennorrhea of the eyes in rabbits.** Klin. M. f. Augenh., 1928, v. 81, Nov., pp. 648-651.

The experiments failed to produce the clinical picture of gonoblennorrhea, nor could gonococci be demonstrated in smears and cultures on ascites-agar. *C. Zimmermann.*

Fehmi, Nouri. **Treatment of trachoma by diathermocoagulation.** Rev. Internat. du Trachôme, 1928, v. 5, Jan., p. 31.

The author reports most excellent results in fifteen cases of florid trachoma treated by the Worms and Blanchard technique, slightly modified, with the Koch-Stertzel apparatus. The active electrode is applied to the palpebral conjunctiva, using a current of 100-250 milliampères for twenty to twenty-five seconds. This is of course preceded by thorough anesthesia by novocain injection. Different areas of the conjunctiva are thus treated, the total time at each sitting being not more than one minute. Edema of the lid appears in fifteen minutes and lasts four or five days, but at no time is there pain. After subsidence of the edema, one sees an eschar which sloughs in three or four days, leaving a soft and nonretractile scar. Four or five treatments some days apart cause complete disappearance of the granulations, and no relapse or complication has been noted over a period of six months. *George H. Stine.*

Scalzitti, G. **Micoses of the palpebral conjunctiva.** Ann. di. Ottal., 1928, v. 56, Nov., p. 1023.

A fungus was found in the conjunctiva of a child of eleven years, who appeared to be suffering from a bilateral conjunctival catarrh. The right upper lid was slightly edematous. On everting the lid, at about one cm. from the outer angle were discovered two small grayish yellow prominences each about the size and form of the head of a pin These could not be removed by moderate mechanical efforts. Around each point a corona of fine grayish lines was visible. None of the other ocular tissues was affected. Biological examination demonstrated under staining mycelial filaments. It was not possible to determine the species. Inoculation showed rabbits peculiarly vulnerable but that guinea pigs appeared to be immune.

Park Lewis.

Sedan, J. **Abscess of the lacrimal sac recurring with each acute attack of unilateral trachoma.** Rev. Internat. du Trachôme, 1928, v. 5, Jan., p. 28. (See Section 14, Eyelids and lacrimal apparatus.)

Zamkovsky, I. G. **Chaulmoogra oil in the treatment of trachoma.** Arch. Oft. (Russian), 1928, v. 5, pt. 2, pp. 127-135.

In twenty-two cases of trachoma chaulmoogra oil was applied to one eye with conjunctival massage, while the fellow eye was treated in a similar way with pure vaseline. There was no material difference between the therapeutic effects of these two applications. The author denies any specific value of chaulmoogra oil in the treatment of trachoma.

M. Beigelman.

6. CORNEA AND SCLERA

Archangelsky, V. N. **On the pathology of Kaiser-Fleischer pigmentation of the cornea.** Russkii Opht. Jour., 1929, Jan., pp. 3-6.

The pathologic findings in a case of circular pigmentation of the cornea observed in Wilson's disease are reported. The pigment granules, larger at the limbus and smaller in the center of the cornea, were located in the

posterior part of Descemet's membrane. Neither the nature of the pigment nor the manner of its penetration into Descemet's membrane could be determined. *M. Beigelman.*

Carrère, L., **Experimental tuberculosis of the cornea.** Bull. Soc. Franç. d'Opht., 1928, p. 141.

Carrère produced experimental tuberculosis of the cornea in rabbits and dogs by injection of living bacilli subconjunctivally, intrasclerally, and into the anterior and posterior chambers. Subconjunctival injections ordinarily produced only a localized nodule tending toward ulceration and secondary cicatrization without lesion of the globe, but with secondary lymph gland involvement. One animal, however, inoculated near the limbus, showed diffuse corneal infiltration without involvement of the iris or anterior chamber. The organisms were demonstrated in the corneal stroma after section. Carrère recalls that at the limbus there exists considerable lymphoid tissue from which the tuberculous process may spread by continuity or by means of phagocyted organisms. He asks if a similar process does not take place in certain forms of interstitial keratitis, preceded by a focus of episcleritis at the limbus, accompanied by cervical and maxillary adenitis.

Intrascleral inoculation in the dog produced changes in the cornea characterized by thickening of the epithelium with intense pigmentation of all the cells. Carrère classes this as a case of sclerosing keratitis. Anterior chamber inoculation produced iritis with pupillary exudate and precipitates on the posterior surface of the cornea. One rabbit inoculated in the posterior chamber presented after twenty days a point of infiltration near the center of the cornea. The formation of this corneal tubercle was explained by the presence of phagocyted tubercle bacilli in one of the deposits on Descemet's membrane, resulting in destruction of the membrane and invasion of the corneal stroma. The author believes that certain deep keratitides appearing in the course of iritides, uveitides, or iridocyclitides have a similar origin.

Phillips Thygeson.

Gabszewicz, J. **On the use of embryonal extract in some diseases of the eye.** Klin. Oczna., 1928, Oct., pp. 133-139.

Prompted by reports on the value of embryonal extract in tissue cultures, the author experimented with it on a series of corneal ulcerations. He used an extract of eight to ten-day chicken embryos, in the form of frequent eye baths or instillations into the eye, and he reports splendid results regarding duration of the healing period and transparency of the scar tissue. *M. Beigelman.*

Ling, W. P. **Interstitial keratitis with unusually marked chorioretinitis.** Arch. of Ophth., 1929, v. 1, Feb., pp. 207-218.

The author had the unusual opportunity of examining microscopically a case of interstitial keratitis. The patient, a boy of fourteen years, gave all symptoms of congenital lues with a strongly positive Wassermann. The Mantoux test was also strongly positive. The left eye was finally removed when it refused to yield to any form of treatment. At the time of its removal, vision was reduced to perception of light, there was intense conjunctival and pericorneal injection, with photophobia and lacrimation The cornea was densely infiltrated and vascularized, the tension slightly increased. After a detailed description of the microscopic findings, the author discusses points of special interest under fifteen different headings. The most notable of these were the following:

Bowman's membrane was irregular in thickness, being reduced in places to a thread-like structure; very few lymphocytes were found; the nodules were composed almost entirely of proliferated fixed corneal cells; retrogressive changes, cicatrization, etc. were not noted in the cornea. The

region of Schlemm's canal was densely infiltrated with numerous lymphocytes, probably a chemotactic infiltration. The upper portion of the anterior chamber contained a large mass of connective tissue membrane having a regular, parallel arrangement of its fibers like the corneal lamellæ, which tissue might have given rise to the appearance of "Glashautleisten" on the posterior surface of the cornea. Its location, however, was not characteristic. It is possible that this tissue was formed from the endothelium of the cornea, as suggested by Watanabe. There was considerable destruction of the rods and cones in connection with choroiditic lesions, especially about the disc. Vascular changes throughout iris, ciliary body, and retina were conspicuous by their absence. *M. H. Post.*

Löwenstein, A. **New formation of bloodvessels in tuberculous keratitis, with remarks on the development of the corneal vessels.** Klin. M. f. Augenh., 1928, v. 81, Nov., pp. 607-612. (2 ill.)

Löwenstein assumes two different kinds of vascular neoformation in the cornea. One very common is due to disturbance of nutrition, which starts from the infiltrative and embolic processes of the pericorneal area (trachomatous, scrofulous pannus, deep vessels in parenchymatous or sclerosing keratitis). The other is chemotactic, due to infections of the cornea (tuberculous, fascicular keratitis, corneal ulcers). Both processes may occur simultaneously.

C. Zimmermann.

Merkulow, I. and Shick, I. **Roentgen therapy of parenchymatous keratitis.** Klin. M. f. Augenh., 1928, v. 81, Nov., pp. 673-684

Twenty-two cases were treated and are arranged in tabular form, eighteen recent, four old. Wassermann reaction was positive in 81.8 percent. Of the four negative cases, two were tuberculous. Local roentgen therapy was applied exclusively in ten cases, and general specific measures were adopted after the parenchymatous keratitis had subsided, the author striving thus to ascertain whether healing was due to the local roentgen or general therapy. In the second group of twelve cases in which general treatment had been commenced, local roentgen and simultaneous specific therapy (mercury, salvarsan, iodin, cod liver oil, etc.) were applied. Two or three radiations sufficed to give the process a favorable course. Of eighteen comparatively recent cases eleven attained normal vision and two more were completely cured, though with imperfect vision due to a small macula from a simultaneous phlyctenular ulcer. Old cases, accompanied by connective tissue formation in the infiltrated area and destruction of the corneal lamellæ, gave little prospect from the start. No disagreeable complications arose from the treatment. The slit-lamp was of great value in the investigation of the effects of the roentgen rays. *C. Zimmermann.*

Moore, R. F. **Caterpillar hair ophthalmitis (ophthalmia nodosa).** Brit. Jour. Ophth., 1929, v. 13, Feb., p. 57.

Two weeks previously a boy aged twelve years had been struck in his right eye by a "woolly bear." The eye was greatly inflamed, there were deposits on the back of the cornea, and the anterior chamber was about a quarter full of pus. There was marked intolerance to light. By means of a lens and later a slit-lamp several fine hairs were observed deeply embedded in the substance of the cornea. No hairs were found in the conjunctiva. It was impossible to remove the hairs. After five weeks of hospitalization the eye became quiet, vision 6/12. Three and one-half months after the accident the eye was quiet and free from inflammation. There was no recurrence, and final vision was 6/6.

Extraordinarily sharp must be the points of such structures as these hairs, in order that they shall pene-

trate quite deeply so tough a structure as the cornea. Their fineness is manifest when they are examined in the cornea by means of a slit-lamp. It has been suggested that the hairs are capable of migration in the tissues of the eye. Were the barbs directed away from the point of the hair, this would seem likely, but they are not so arranged. In the case of the gold-tailed moth, Eltringham's diagrams show the barbs pointing away from the point of the hair, so migration in that case might well occur. Hairs from live caterpillars seem to contain a poison, those from dead are much less irritating.

D. F. Harbridge.

Moretti, Egisto. **Clinical studies of trachomatous keratitis with the corneal microscope.** Rev. Internat. du Trachôme, 1928, v. 5, Oct., p. 132.

Moretti describes the appearance of pannus tenuis (thirty cases), vascular pannus (ten cases), and pannus crassus (four cases) as shown by the corneal microscope. In very early pannus tenuis he found very small superficial vessels passing over the upper limbus for a distance of not more than one and a half millimeters, and looping back without anastomosing. The intervascular areas showed fine grayish spots in the superficial corneal layer. The presence of this type definitely differentiates trachoma and follicular conjunctivitis. Older pannus tenuis showed two forms of neovascularization, differing only in the frequency of anastomoses. The vessels appeared in two superimposed planes, the more superficial being venous in flow, and the deeper arterial. The frequent anastomoses form arcades, over which the epithelium is rough and thickened. Near the limbus, a gray infiltrate was present and the center of the cornea showed fine grayish spots in the superficial layers. The arcade type of vascularization was most common.

Vascular pannus was characterized by numerous vessels, situated superficially and deeply throughout the cornea. Between the meshes of the plexus were many fine gray flecks. more numerous near the limbus. Trichiasis was present in all cases that showed arborescent ramifications of the vessels.

In the cases of pannus crassus, the entire corneal substance was invaded by the vessels, which, with gray infiltrate, gave the cornea the appearance of the sclerotic.

Superficial erosions, lasting eight to ten days, and ulcers were present in all cases except those of pannus tenuis. The ulcers were due to the breaking down of gray, glistening, round nodules lying in the most superficial layers of the cornea between the vessels, and composed of many fine flecks. Fluorescein did not stain them. They healed in about one month and a half, leaving flat facets with finely infiltrated margins.

George H. Stine.

Vogelsang, K. **Hemorrhages in the anterior segment of the eye with blue sclera.** Klin. M. f. Augenh., 1928, v. 81, Nov., pp. 684-686.

In the right eye of a married woman aged thirty-one years, with blue sclera, a sudden hemorrhage occurred during the night The anterior chamber was totally filled with blood, the sclera impregnated with blood, and the whole conjunctiva covered subconjunctival hemorrhage. There were no other signs of mesenchymal weakness, but the hereditary factor appeared in the blue scleras of a daughter of six years. The author assumes as a cause mesenchymal dysplasia, as reported by Colden, who observed sclerosis of the choroidal vessels in a case of blue scleras.

C. Zimmermann.

Wiegmann, E. **Is tattooing according to Knapp entirely without danger?** Klin, M. f. Augenh., 1928, v. 81, Nov., pp. 667-668.

A girl aged eighteen years, three weeks after having her left cornea tattooed successfully on account of chalk-white shrunken cataracta ac-

creta, returned with redness, hypotension of this eye, and numerous precipitates. This was probably a relapse of a process from her early youth, perhaps a tuberculous uveitis. After long continued treatment it healed, but the tattooed area had cleared considerably. *C. Zimmermann.*

7. UVEAL TRACT, SYMPATHETIC DISEASE AND AQUEOUS HUMOR

Abe, T., and Komura, K. **Experiments in rabbits on changes in the aqueous humor.** Graefe's Arch., 1929, v. 121, p. 304.

After an intravenous injection of fluorescein, the latter increases rapidly in the aqueous humor until about forty minutes after the injection. Its transference then diminishes; later it increases again and finally proceeds slowly. The primary rapidity depends upon the diffusion of the fluorescein into the aqueous and the subsequent diminution upon its escape through the chamber-angle. The diffusion of the fluorescein into the aqueous is apparently but little promoted by movements of the eyelids; on the other hand the excretion of the fluorescein from the aqueous is considerably increased by the lid movements.

H. D. Lamb.

Kronfeld, P. C. **The regeneration of the aqueous humor.** Arch. of Ophth., 1929, v. 1, Feb., pp. 231-240.

From a very careful study of the first and second specimens of aqueous humor, especially as to the sodium chloride and the carbon dioxide content, the author concludes that the regeneration of the aqueous humor is a physiochemical process corresponding completely neither to dialyzation nor to filtration. The vital component is the relative capillary dilatation, which depends on the relative size of the anterior chamber as regards that of the entire eyeball. In animals this capillary dilatation is combined with dilatation of the fine arteries, which presents a large supply of arterial blood. In human beings, on the contrary, dilatation of the arteries does not take place to a sufficient extent, so that the capillaries become filled with venous blood. The author feels that the results which he has obtained from chemical examinations previously mentioned indicate that under normal conditions the vitreous humor has little to do with refilling of the anterior chamber. He is of the opinion that study of the carbon dioxide content of the ocular fluids gives valuable new information concerning regeneration of the aqueous humor.

M. H. Post.

Pollack, Herbert. **Apikosan in rheumatic iritis.** Klin. M. f. Augenh., 1928, v. 81, Nov., pp. 668-671.

The popular observation that rheumatic patients who were stung by bees claimed great improvement, even disappearance of their ailments, prompted the author to produce a solution of the poison of bees for intracutaneous injection. He obtained very satisfactory results in rheumatic iritis and severe cases of trifacial neuralgia. For injection, ascending from 0.2 to 0.7 c.c. generally sufficed for a cure. The preparation is manufactured by the Chemische Fabrik, Dr. August Wolff, Bielefeld, Germany.

C. Zimmermann.

Tieri, A. **The morphological syndrome of the iris in tabes and in progressive paralysis.** Ann. di Ottal., 1928, v. 56, Dec., p. 1112.

The author's observation of twenty-three cases leads him to the following conclusions. The iris is among the earliest tissues affected in neurosyphilis, and the degenerative changes are marked and distinctive. The following are the diagnostic features found in the iris in tabes and in progressive paralysis:

Tabetic triad

1. Atrophy of the iris general or segmental.
2. Irregularity of the pupil, which is obliquely oval.
3. Anisocoria definite and persistent.

Paralytic triad

1. Degenerative chromoatrophy confined to the sphincter.
2. Irregularity of the pupil, which is unevenly rounded, wavy, or notched.
3. Anisocoria definite and persistent.

He regards these symptoms as of greatest importance in making an early diagnosis. Later, as the disease progresses, they may all be present, as both affections may coexist as in a tabo-paralysis. *Park Lewis.*

Tieri, A. **The pathogenetic theory of the Argyll Robertson pupil.** Riv. Oto-Neuro-Oft., 1928, v. 5, May-June, pp. 212-219.

According to the author's theory the lesion underlying the Argyll Robertson pupil is located in the centripetal photomotor fibers which run in the optic nerve from the retina to the nucleus of the iridomotor fibers. A primary progressive degeneration of these fibers is determined by the syphilitic virus, with consecutive abolition of the photomotor reflex, while the fibers for accommodation, which are not so early receptive for the spirochete, maintain their function until they also become affected. (Bibliography and three figures.)
M. Lombardo.

Wilmer, W. H. **Cyst of the uveal layer of the iris at the pupillary margin.** Arch. of Ophth., 1929, v. 1, Feb., pp. 162-167.

The author goes into the history of this condition rather extensively and reports numerous cases from the literature. He then reports a case of his own in which both eyes showed total posterior synechias with iris bombé. There was a dark brown mass three by three and one-half mm. protruding from the posterior pupillary margin of the left eye. It was dark, nontranslucent, granular, and restricted at its base. There were pigment granules distributed over the surface of the cyst, the iris, and the anterior capsule of the lens. There were large patches of retinitis proliferans in the right eye. The vision was 20/200. The left eye showed cupped disk and a tension of 43 mm., with vision of 20/40. Following a sclerocorneal trephining the cyst collapsed. Eventually a cataractous lens was removed and vision of 20/50 was obtained.

Two beautiful drawings accompany the article. The cyst appeared to have been caused by pressure of the aqueous, which stretched the entire uveal layer. In addition, the pigment epithelial cells proliferated, resulting in a cyst with walls much thicker than stretched uveal tissue could be responsible for.

The etiology of thirty-six cases found by the author was as follows: Twenty were primary, seven resulted from injury, three followed glaucoma after injury, and six occurred with occlusion of the pupil or glaucoma, under which latter classification the author's case falls. It should be noted that spontaneous cysts are occasionally so nontranslucent as to appear solid, rendering the diagnosis from malignancies difficult, especially since melanosarcomas are found in a similar position; and the author feels that if the eye is painless a biopsy should be performed. *M. H. Post.*

8. GLAUCOMA AND OCULAR TENSION

Gapejeff, P. I. **Clinical observations on the action of adrenalin, glaucosan, and pituitrin on glaucomatous hypertension.** Klin. M. f. Augenh., 1928, v. 81, Nov., pp. 626-630. (2 curves.)

Five illustrative cases are reported. Pituitrin in subconjunctival injections of 0.5 c.c. may supplant adrenalin and glaucosan in glaucoma simplex, from which it favorably differs by not dilating the pupil and by causing such slight increase of blood pressure that the general condition of the patient is not affected. *C. Zimmermann.*

Hamburger, Carl. **Reply to Boehm: An acute attack of glaucoma in both eyes after instillation of glaucosan.** Graefe's Arch., 1928, v. 121, p. 241.

Hamburger contends that Boehm did nothing to prevent the acute glaucomatous attack after the use of glaucosan. Hamburger states that he has constantly and repeatedly called attention to the possibility of such an attack—which recedes usually without leaving any ill effects—and has endeavored to learn how to prevent it.

Why was the glaucosan used in both eyes at the first visit? Could not the physician have waited twenty-four hours after the use of glaucosan in one eye to see reaction before using it in the second eye? Although the patient was observed for five days after the use of glaucosan no use was made of Hertel's valuable intravenous injection of ten c.c. of ten percent sodium chloride solution, nor of the too little used blood-letting, which influences favorably so many acute attacks.

In the right eye Boehm used histamin (amin-glaucosan) two days after the beginning of the attack instead of one to two hours after instillation of the glaucosan as Hamburger has recommended. Boehm evidently used it but once and repeated it three days later.

H. D. Lamb.

MacRae, Alexander. **Pseudoglaucoma.** Brit. Jour. Ophth., 1929, v. 13, Feb., p. 63.

In a girl aged thirteen years and nine months, capillary nevi were scattered all over the body. The right arm and hand were larger than the left. The mother gave a history of having fallen downstairs seven months before the birth of the child. The left eye was normal in appearance and vision. The right had light perception in limited parts of the temporal fields. Tension and external and internal appearances were normal, except the disc, which was smaller than normal and instead of being round was horizontally rectangular. The margins overhung a deep goblet-shaped excavation, the floor of the cup being five diopters deep. To the nasal side emerged two vessels, the lower and broader one dividing into two vessels which probably corresponded to the superior temporal and nasal arteries, while the other vessel in all probability was the central vein. There was no difference in color to distinguish artery and vein. The presence of other body abnormalities, the peculiar shape of the disc and arrangement of vessels, with absence of pain and of increased tension, suggested that the condition was congenital. (Three illustrations.)

D. F. Harbridge.

Redslob, E., and Reiss, P. **Experimental variations of intraocular tension.** Ann. d'Ocul., 1929, v. 165, Jan., pp. 1-13.

Experiments on enucleated eyes of oxen showed that the injection of acid solution, by reducing the hydrogen-ion concentration, reduced the intraocular tension and that alkaline injections of acid increased it. A similar result was found in the living rabbit. In a man with acute glaucoma and a tension of one hundred mm., an injection of acid solution in the vitreous, after failure of drugs and of two operations, caused a marked reduction in tension and relief from pain. Tension slowly rose to sixty mm. three weeks later, but pain had not returned. It was planned to try iontophoresis in the next case.

Lawrence Post.

Sédan, Jean. **Special technique of sclerectomy (Lagrange) in glaucomatous cases affected with sclerocicatricial trachoma.** Rev. Internat. du Trachôme, 1928, v. 5, July, p. 104.

Sédan finds that the thickened, cicatrized conjunctiva of old trachoma is a serious handicap in securing good drainage by Lagrange's sclerectomy. Not only is the dissection of the bulbar conjunctiva difficult, but the poor quality of the altered membrane also prevents proper formation of the aqueous bleb and absorption of the fluid. He therefore makes a large triangular conjunctival flap, about eight millimeters broad and six millimeters high,

apex up and base at the limbus, in any case of chronic glaucoma that shows traces of trachomatous cicatrices in the conjunctiva of the upper lid. It is essential that the flap be completely free right down to the limbus. After the other steps of the operation have been completed the flap is replaced over the scleral opening. This procedure has given better and more permanent results than heretofore obtained.

George H. Stine.

9. CRYSTALLINE LENS

Alexeev, S., and Tchepoorin, N. **On the "open" treatment in ophthalmic surgery.** Russkii Opht. Jour., 1929, Jan., pp. 55-64.

In eighty-four eye operations, of which forty-seven were cataract extractions, Fuchs's net was the only protection used for the operated eye. There was no delay in restoration of the anterior chamber, and the microscopic flora of the conjunctival sac did not show any changes during the postoperative period. Two cases of cataract extraction were followed by infection which, in the author's opinion, was in no way connected with omission of the dressing.

M. Beigelman.

Ascher, Karl. **Improvement of akinesia in cataract operations by akinesia of the levator.** Klin. M. f. Augenh., 1928, v, 81, Nov., pp. 664-665.

To prevent possible lagophthalmus after injection of novocain, Ascher recommends injection into the levator through the upper retrotarsal fold at its center *C. Zimmermann.*

Aubaret. **Replacement of the iris in cataract extraction with the double keratome.** Bull. et. Mém. Soc. Franç. d'Opht., 1928, p. 201.

Aubaret favors the double keratome in making the corneal section and summarizes its advantages. There is no counterpuncture to empty the anterior chamber and suddenly reduce the intraocular tension. A sufficiently wide opening is obtained to allow expulsion of all varieties of cataracts, and the perfect coaptation of the wound edges favors cicatrization and reduces to a minimum iris prolapse and accidental opening of the incision. Consequently iridectomy can be almost entirely eliminated and simple extraction practised routinely. If iris prolapse does occur the author prefers to wait forty-eight hours after the operation. Retrobulbar anesthesia is first used and the wound then partially opened with a spatula, this being easily done in spite of the advanced cicatrization. The iris can be returned to position without iridectomy unless vitreous is included in the wound, when iris resection is necessary. If much cortex remains in the anterior chamber, an evacuation with the Daviel curette is not contraindicated. *Phillips Thygeson.*

Battista, L. G. **Blood pressure and cataract.** Ann. di Ottal., 1928, v. 56, Nov., p. 961.

The author had an opportunity of examining the eyes of 300 aged and invalided, between 60 and 95 years, in the Viterbo hospital. 143 had opacities of the lens, or 48 percent. About half of those did not have cataractous lenses. While in those from 65 to 75 years there was a preponderance of transparent lenses, from 75 to 85 the number having cataracts was three to two, and in only one-third were they absent. Cataract limited to one eye was found only in those under 70 years; over that age both eyes were affected, usually with sclerosed nuclei. In those with nuclear sclerosis the urine had always an abundance of uric acid.

The relation of cataract to blood pressure was variable. In 63, or 21 percent, the tension was normal or below 130 mg. Hg. Sixty-nine had hypertension (170 to 200 mg. Hg.), while 147 had medium tension (145 to 170). A little more than 57 percent of those with normal tension had cataract. Of 69 with high blood pressure, in 39 the eyes were normal and

30 were cataractous. Of the individuals having marked arteriosclerosis 46 percent had cataract, while of those with normal or medium tension opacities were present in 72 percent.

The author concludes that the toxic substance, whatever it is, that causes sclerotic alterations in the arteries and produces hypertension does not affect the crystalline lens, and that the opacities associated with old age are of purely local origin, and are a prelude to death of the lens.

Park Lewis.

Bidault, R. **Anatomic and functional study of retinal circulation in old age.** Ann. d'Ocul., 1929, v. 165, Jan., pp. 13-23.

Using the instrument and method of Bailliart, it was concluded that in normal old age there was a relative hypotension of the retinal arteries.

Lawrence Post.

Dansan. **Avoidance of dressings after cataract extraction.** Bull. et Mém. Soc. Franç. d'Opht., 1928, p. 209.

Dansan, since 1906, has used no dressings after cataract extraction, protecting the eyes only with wire-grilled spectacles for three days, then with ordinary smoked glasses. In 728 operations he has had only one complicated by panophthalmitis, eight by iris prolapse, and eight by mild hyphema. This method prevents the rapid microbic growth which occurs when the lids are constantly closed and when the secretion and drainage of tears is interfered with. The corneal wound heals rapidly, with absence of redness and irritation. In addition the patient is rendered more comfortable and the incidence of post-operative delirium is reduced.

Phillips Thygeson.

Giannantoni, A. **Relation of congenital cataract to changes in the neurovegetative system.** Ann. di Ottal., 1928, v. 56, Dec., p. 1063.

Various opinions and theories are reviewed as to the etiology of congenital cataract. The vegetative nervous system is divided into two antagonistic parts, one stimulating and one inhibitory. The peculiar characteristics of the neurovegetative system predominate during the period of development, but those of the vagus as old age progresses. A middle period obtains in which an equilibrium is maintained. If during intrauterine life anything occurs to disturb this normal nervous interchange, tissue development may be interrupted and lens opacities result.

Skin reactions were provoked in cases of congenital cataract by the author and the results compared with normal controls. In the view of many authors degenerative lens changes are the result of deficiencies in the internal secreting glands, and these in turn are affected by the sympathetic nervous system. The author's experiments lead him to conclude that this is not a fact or at least is not demonstrated. Out of twelve subjects tested, seven were predominantly vagotonic and five in equilibrium. In none did the cutaneous reaction show hypertonicity of the sympathetic.

Park Lewis.

Haass. **An expansible lance-shaped knife for cataract operation.** Klin. M. f. Augenh., 1928, v. 81, Nov., pp. 659-663. (3 illustrations.)

Haass describes and illustrates his new instrument, which consists of a double lance-shaped knife with crossed handles on the order of Matthieu's iris forceps. It is introduced closed and is opened by pressure on the handles, producing a section large enough for extraction of the lens. For its successful manipulation, hypotension of the eyeball from cocaine must be avoided and four percent novocain with suprarenin should be used as an anesthetic. *C. Zimmermann.*

Smith, Henry. **The nutrition of the lens and of the vitreous.** Arch. of Ophth., 1929, v. 1, Feb., pp. 159-161.

In this brief communication the author draws an analogy between the

nutrition of the lens and vitreous and that of the fetus in utero. He calls attention to the fact that the nutrition of the fetus and its elimination takes place through a limiting membrane. The nutrition arrives by way of the blood stream through comparatively small arteries and is distributed into the vast area of the sinuses. It is impossible for the heart of itself to drive this blood through these large sinuses into the veins. It is his opinion that this blood lies in these sinuses until forced forward into the venous circulation by periodic contractions. In a similar manner the lens and vitreous are enclosed in limiting membranes and are bathed in aqueous humor which is secreted by the cells of the ciliary body.

He believes that senile cataract and glaucoma are due to starvation because of disturbances in this mechanism and changes in the aqueous, cataract being one type of disturbance, glaucoma another, the second inducing an edema of the vitreous. He recommends that careful records of the pulsation of the aqueous be taken in comparison with those of the cardiac impulses, and that the aqueous be studied in health, in the immature stages of cataract, and in acute and chronic glaucoma in the living subject. *M. H. Post.*

10. RETINA AND VITREOUS

Amsler, Marc. **Reflections on the state of our knowledge concerning the pathogenesis of retinal detachment.** Bull. et Mém. Soc. Franç. d'Opht., 1928, p. 269.

Amsler summarizes in outline form the literature on idiopathic retinal detachment appearing in the past six years. He concerns himself with the theories of origin and touches only lightly upon the various therapeutic measures. The subject is not limited as formerly to purely local anatomic processes, but now is concerned with various general pathologic conditions. With the increase in our knowledge, the group of idiopathic retinal detachments will shrink as have the essential atrophies of the optic nerve.

Phillips Thygeson.

Barkan, Hans. **Air embolism of the retinal vessels.** Trans. Amer. Ophth. Soc., 1927, v. 25, p. 225. (See also this Journal, 1928, Oct., p. 850.)

The patient, a male aged thirty-five years, thought he had aspirated a bone while drinking soup. A few months later he had violent spasms of coughing, with expectoration of exceedingly foul sputum. When first examined he was bringing up occasional small amounts of blood and constant foul sputum, and was coughing continually. The possibility of an abscess surrounding a foreign body in the right lower lobe was considered and operation advised. In the course of the operation the man collapsed alarmingly. Upon leaving the operating table he complained that he could not see; and he was amaurotic for twenty-four hours. Subsequently a bone was removed from the right major bronchus. At a third operation further lung abscesses were opened and there was considerable bleeding from a large vessel on the side of a bronchus. The patient collapsed. The violent spasms of coughing suddenly ceased, the pupils dilated, and he was completely amaurotic. The pupils did not react to light. He remained amaurotic for six days and then began to recognize large objects. After this, upon packing with iodoform gauze, he was again completely amaurotic for twelve hours. The fundus examination was negative. The fields showed an absolute hemianopic quadrant defect for red and green; relative central scotoma for red and green; the blind spot normal.

The case report is accompanied by a brief review of the literature of these cases and a description of the appearance of the retina in air embolism in animal experimentation.

John A. McCaw.

Borel, Georges. **Retinal hemorrhages in Vaquez's disease.** Bull. et

Mém. Soc. Franç. d'Opht., 1928, p. 252.

Borel emphasizes the diagnostic importance of the fundus examination in polycythemia, and reports the case of a woman aged sixty-seven years in whom the diagnosis was made ophthalmoscopically. The fundus was found to be carmine-colored, the veins of three times normal caliber and filled with red blood. Multiple small hemorrhages, some in process of resorption, lay along the veins, which were undulant, worm-like, with fusiform swellings. These swellings were found to vary in nature at different examinations and were probably due to temporary venous stagnation with heaping up of the red blood corpuscles. Puncture of the lids and conjunctiva produced a viscous, stringy hemorrhage, almost oily, due to the increased viscosity of the blood. Radiotherapy caused a surprising effect. Within ten days the visual acuity had risen from 0.3 to 1.0, and the ophthalmoscopic picture had returned to normal. All general symptoms disappeared and the patient felt herself to be entirely healed.

Phillips Thygeson.

Dubar, J., and Lamache, A. **Note on the relation between retinal arterial tension and that of the cerebrospinal fluid.** Bull. et Mém. Soc. Franç. d'Opht., 1928, p. 259.

The retinal arterial tension, as determined by the method of Bailliart, is directly proportional to that of the cerebrospinal fluid in cases of both increased and decreased intracranial pressure. The authors stress the clinical importance of this relationship in cases in which the lumbar cul-de-sac has been walled off from the rest of the subarachnoidal space. They have been able to disclose increased intracranial pressure, and later confirm it by ventricular puncture, in individuals in whom the lumbar manometer gave normal readings. The method permits following from onset the rises in tension due to tumors or meningitides, particularly serous meningitis.

Phillips Thygeson.

Ginzburg, J. **Ocular changes in congenital heart affections with polyglobulia.** Klin. M. f. Augenh., 1928, v. 81, Nov., p. 591-607

Three cases are described in detail. The ophthalmoscopic changes grew with the increase of the heart affection. In the first case, only hyperemia of the disc and darkness of the veins were observed; in the second the typical picture of cyanosis retinæ, the disc light red, arteries and veins very ectatic and tortuous, giving the picture of caput Medusæ; in the third, in addition to these changes, also aneurismal ectasias of the veins in the shape of round or fusiform expansions of the vascular walls. Finally, at the height of the general symptoms and of the circulatory disturbances in the eye, hemorrhagic glaucoma developed, with loss of the eye. The cases also showed that the partial enlargements of the veins described by Uhthoff in polycythemia vera may also occur in congenital heart affections if these elicit the same intense circulatory disturbances.

C. Zimmermann.

Gonin, J. **Tears in detachment of the retina.** Bull. et Mém. Soc. Franç. d'Opht., 1928, p. 275.

Gonin reiterates his belief that so-called idiopathic retinal detachment never occurs without a tear, and that closure of this tear is necessary to obtain lasting cure. In a series of sixty detachments, one or more retinal tears were found in fifty-three. Of the other seven, six had opacities of the media preventing ophthalmoscopic examination, and one presented no other obstacles than the impossibility of examining the region of the ora serrata. The majority of the tears were found in a narrow zone, measuring about seven mm., separating the equator from the ora serrata, thus explaining the failure of many observers to find them. The author's operation of deep thermocauterization for closing the rent has been successful in over fifty percent of the cases in which it has been applied. *Phillips Thygeson.*

Holloway, T. B., and Verhoeff, F. H. **Disc-like degeneration of the macula.** Arch. of Ophth., 1929, v. 1, Feb., pp. 219-230.

Eight cases are reported, with a microscopic examination in the eighth. In the right eye of case eight the ophthalmoscopic examination showed a pear-shaped mass, grayish white with a faint greenish tinge, directly in the macular region. It was 2.5 disc diameters in width, three diameters in height. The upper margin faded away gradually into the macular region. To the nasal side there was an old yellowish white area; to the temporal side an irregular yellowish white area similar to the former. Below there were numerous pinhead-sized lesions of a similar appearance.

Microscopic examination showed this central lesion to be composed of connective tissue, probably produced by proliferating cells of the pigment epithelium, as all transitional stages of cells could be made out. It lay between choroid and retina and received it blood supply from the choroid apparently through an intact membrane of Brück, though one vessel was found entering from the retina. Both Brück's membrane and the external limiting membrane of the retina were intact. The choroid, however, was reduced to about one-half its normal thickness behind the mass, and the retina lying over it was much altered. The outer nuclear layer was completely destroyed, the rods and cones were much changed, but the outer nuclear layer and the ganglion cells were well preserved. Numerous colloid bodies were found in Brück's membrane in the neighborhood of the mass. In six patients there were circinate exudative lesions, unilateral in all but one case. In one case these lesions disappeared, only to reappear. In another patient they disappeared in one eye, but became more marked in the other. Dense hemorrhagic circinate lesions preceded the characteristic exudate in two instances. In two other cases definite tumor-like masses developed within the circinate area, and in the eighth case, examined microscopically, the central tumor mass was unaccompanied by the circinate lesion. It would appear from this that circinate lesions are usually present with these medullary plaques, and that their absence at the time of observation does not preclude their presence during some stage of the disease.

M. H. Post.

Löwenstein, A. **Hypersensitiveness to tuberculin.** Klin. M. f. Augenh., 1928, v. 81, Nov., pp. 612-616.

Three cases of intraocular hemorrhage are described, in two of which minimal doses of old tuberculin brought about renewed hemorrhage. In one the hemorrhage did not recur after tuberculin, but the injections were followed by intense general and puncture reactions. Probably the direct propagation of the products of metabolism of the vascular focus into the blood without a filtering action of the reticuloendothelial system may be the cause of the hypersensitiveness. The intracutaneous is recommended as the best mode of application.

C. Zimmermann.

Ovio, G. **One of the factors in the lower vision outside of the fixation point, with an optical theory of the retina.** Ann. di Ottal., 1928, v. 56, Dec., p. 1057.

The reason commonly accepted for the diminished visual acuity on recession from the macula is the lessened sensibility of the retinal elements. The author notes that the foci of luminous rays entering the eye after crossing are not all of the same length, and that, the oblique rays being shorter, circles of diffusion are formed where the rods predominate. Anatomically the finer retinal elements are fewer in the periphery. This is not the fact in many of the lower forms of life, whose necessities are other than those in man. Optically more clearly defined images are formed on the fovea, which is anatomically better constructed to receive them.

Park Lewis.

Smith, Henry. **The nutrition of the lens and of the vitreous.** Arch. of Ophth., 1929, v. 1, Feb., pp. 159-161. (See Section 9, Crystalline lens.)

11. OPTIC NERVE AND TOXIC AMBLYOPIAS

Borel, Georges. **Bilateral optic atrophy in familial spastic diplegia of cerebral origin.** Bull. et Mém. Soc. Franç. d'Opht., 1928, p. 295.

Borel reports two cases of familial spastic diplegia accompanied by double optic atrophy. The importance of consanguinity in the etiology of the condition is well illustrated in the author's two cases, both being of the same family and of parents who were first cousins. The disease nearly always attacks boys, and, like color blindness, hemophilia, progressive muscular dystrophy, and so on, is transmitted by the female, who herself escapes. The extreme rarity of the disease in France is attributed to the strict marriage laws prevailing there.

Phillips Thygeson.

12. VISUAL TRACTS AND CENTERS

Farid, Nasr. **A case of right homonymous hemianopia.** Brit. Jour. Ophth., 1929, v. 13, Feb., p. 67.

A man aged sixty-five years had vision of right, fingers at twenty cm., left with +2.25 sph. 6/9. The fundus showed chorioretinal changes. He had arteriosclerosis, a heart lesion, and disturbances of the nervous system. Under use of iodides, strychnine, and omission of tobacco and coffee, within two years the hemianopia had practically disappeared. The etiology of this type of lesion falls under one of five headings: thrombosis of the posterior cerebral artery, local hemorrhage of the venous circulation, trauma, chronic meningitis, or compression by a cyst or abscess. The case reported is probably of the second type, a venous hemorrhage into the tracts which was later absorbed. (Two illustrations.)

D. F. Harbridge.

Triossi, S. **Hysteric amaurosis and amblyopia.** Riv. Oto-Neuro-Oft., 1928, v. 5, May-June, pp. 197-211.

The author reports two cases of amaurosis, one of which was monolateral, and two cases of amblyopia of which also one was monolateral. All four were found to be of hysterical nature. In his diagnostic considerations the author includes negative ophthalmoscopy and persistence of the normal pupillary reactions. The visual fields have some diagnostic importance in monocular cases if concentric contraction with inversion of the color fields is present, and if the binocular visual field taken with both eyes open shows a normal temporal limit in the supposedly blind eye. (Bibliography and five figures.)

M. Lombardo.

Weiss, Elizabeth. **Stab injury of the right optic tract.** Klin. M. f. Augenh., 1928, v. 81, Nov., pp. 579-581.

The right lower lid of a boy aged sixteen years was stabbed with a rapier. Vertigo, headache, vomiting, and fever followed. The right pupil was four millimeters, the left seven millimeters in diameter. Illumination from the right side gave prompt reaction of both pupils; from the left side, reaction of the right pupil diminished, the left pupil immobile. Vision was 6/6 and there were no ophthalmoscopic changes, but typical left hemianopsia. Roentgen rays showed a fracture of the lower orbital margin and one involving the superior orbital fissure, with detachment of a bony sequestrum. Diagnosis: injury of the right optic tract where the branches of the middle cerebral artery form a dense network between the tract and the inner capsule. Within two and a half months there was considerable extension of the visual fields, whence the author concludes that the optic tract was not completely severed, but that the function of the uninjured part was disturbed by a hematoma from the vascular lesion. After three months the pupils showed the same

condition, but the optic discs revealed no pathological changes.

C. Zimmermann.

14. EYELIDS AND LACRIMAL APPARATUS

Dupuy-Dutemps, L. **Lupus of the upper lid and eyebrow treated successfully by excision and skin graft.** Bull. Soc. Franc. d'Opht., 1928, p. 120.

Dupuy-Dutemps reports a case of lupus in a man aged twenty-seven years, involving the entire upper lid. No amelioration had been obtained by the use of either radiotherapy or carbon dioxide snow. Contrary to the usual custom, the excision and grafting were done in two stages to minimize cicatricial contraction, the author relying on the immunity of transported grafts to prevent extension of the lupus. The denuded area was covered by a single dermo-epidermal graft, obtained from the thigh. The second graft was done a month later, both taking perfectly. After two years no sign of recurrence or extension was present, the eyelid being supple with mobility unimpaired. Dupuy-Dutemps stresses the importance of never employing grafts from the face, but always from some part of the body where lupus is exceptional. The relative immunity of these grafts has been well demonstrated.

Phillips Thygeson.

Lindberg, J. G. **Abnormal length of palpebral fissure corrected by tarsorrhaphy.** Klin. M. f. Augenh., 1928, v. 81, Nov., pp. 665-667. (Two illustrations.)

At the temporal canthus the margins of the lower lids of a student aged seventeen years, with corectopia, formed a loop, the upper and lower lids leaving an open space in which they were not in contrast with the eyeball. From exposure to the air the conjunctiva at this place was constantly red, and a small pool of tears accumulated. Abnormal tension of the skin of the face was apparently the cause. The anomaly was corrected by tarsorrhaphy. *C. Zimmermann.*

Moscardi, P. **Dacryoethmoiditis.** Riv. Oto-Neuro-Oft., 1928, v. 5, May-June, pp. 228-246.

Among 140 cases of diseases of the lacrimal sac the author found lesions of the ethmoidal cells in twenty. Two of these were cases of peridacryocystitis with anterior ethmoiditis, three were cases of dacryocystitis which became complicated with ethmoiditis after operation on the sac, and the rest were cases of dacryocystitis associated with ethmoiditis. In seventeen of these cases the lesion was limited to the ethmoid, in one case the ethmoid and the maxillary sinuses were affected, and two were cases of polysinusitis. Histologic examination showed that very frequently the inflammatory process affected the mucous membrane of the lacrimal sac, of the nose, and of the ethmoidal cells, demonstrating the strict relation existing among these parts in inflammatory processes. The author concludes that in some cases of chronic dacryocystitis, in cases of peridacryocystitis, and in cases of lacrimal fistula after operation on the sac the ethmoid must be examined, and if necessary both the sac and the ethmoid are to be operated on. (Bibliography and fifteen figures.)

M. Lombardo.

Sédan, J. **Abscess of the lacrimal sac recurring with each acute attack of unilateral trachoma.** Rev. Internat. du Trachôme, 1928, v. 5, Jan., p. 28.

Sédan reports a case, observed for five years, in which suppurative dacryocystitis occurred with each exacerbation of unilateral trachoma on the same side. The unilaterality of both affections, their simultaneous occurrence, and the absence of other pathology, particularly nasal, lead the author to consider trachoma the common cause. Cultures and smears revealed no specific organisms.

George H. Stine.

15. TUMORS

Lacroix, and Pesme, Paul. **Two cases of leucosarcoma of the choroid.**

Bull. et Mém. Soc. Franç. d'Opht., 1928, p. 226.

Two cases of leucosarcoma of the choroid are reported, with complete histopathologic examination. Both tumors occurred in individuals under forty years of age and histologically they were very much alike, consisting of elongated, fusiform cells with large nuclei entirely free from pigment. Scattered through the tumor masses were small collections of pigmented cells, more numerous toward the scleral borders. Careful examination showed these to be only the normal choroidal chromatophores pigmenting the tumors secondarily. Newly formed blood-vessels were everywhere abundant. These two cases corroborate the statements of Lagrange that leucosarcomas tend to occur in relatively young persons, involve the anterior part of the globe, and evolve with great rapidity. The nature of these tumors is still under discussion, but the layer-like arrangement and epithelioid appearance of the cells makes one favor a neuroepithelial origin.

Phillips Thygeson.

Scullica, F. **Pigmentary infiltration of the iris angle in melanosarcoma of the iris.** Ann. di Ottal., 1928, v. 56, July, p. 600.

In a recent article Speciale-Cirincione directed attention to the fact that the deposit of pigment at the iridocorneal angle, easily seen by our common methods of examination, establishes the existence of melanosarcoma in otherwise doubtful cases.

Scullica, who has studied two enucleated globes having this condition, confirms this view and gives pathological and histological reasons to support it. An interesting feature connected with these cases is that the pigment massed in the angle was pronounced in the sector opposite to that occupied by the tumor. The views of Lagrange, Fuchs and others as to the reason for the migration of the pigment are discussed.

Park Lewis.

Seguini, A. **Ocular symptoms in tumors of facial sinuses.** Riv. Oto-Neuro-Oft., 1928, v. 5, Jan.-Feb., pp. 45-65.

The author reports five cases of malignant tumor of the antrum, one of which was found to be a fibrosarcoma under the microscope, one an endothelioma, and two epitheliomata. No specimen of the fifth case could be examined. The youngest of the patients was nineteen, the eldest forty-two years. Two of the tumors which sprang from the right antrum had invaded the orbit and the nasal cavity of the same side; two of the three tumors which originated from the left antrum had invaded the left orbit and nasal cavity, while the other one had invaded also the antrum of the right side.

As to ocular symptoms, diplopia and exophthalmos were noted in all cases; in two cases the eye was displaced forward and upward, in one case forward and slightly outward, in another forward and inward, and one showed a protruded eyeball but no vertical or lateral deviation. The pupil was of normal size and reacted to all tests in cases in which the visual power was not entirely lost. The media of the eye were clear and the fundus examination showed a more or less marked degree of papilledema. One case showed atrophy of the optic nerve. The blind spot was enlarged by all directions, especially in its vertical meridian; the visual field was contracted for form and colors; and all cases in which these tests could be made showed a central scotoma for all colors. (Bibliography.)

M. Lombardo.

Szymanski, Jules. **A case of annular melanosarcoma of the iris.** Bull. Soc. Franç. d'Opht., 1928, p. 38.

The histological study is described. The tumor involved the entire iris circle and penetrated, except for one small area superiorly, the entire ciliary body, the iris angle, the region of Schlemm's canal, and, in the lower segment, the subconjunctival space.

Six weeks after enucleation, the patient showed recurrent melanosarcoma of the orbit. *Phillips Thygeson.*

Terrien, F. **Observations upon tumors of the iris.** Arch. d'Opht., 1929, v. 46, Feb., p. 69.

Four atypical iris tumors are described in detail. The first was in a woman fifty-eight years of age whose left eye appeared inflamed as if from iritis. At the nine o'clock position on the anterior surface of the iris, there was a small tumor which had a reddish color and an irregular surface. The clinical appearance was that of a sarcoma, possibly arising from the ciliary body. Inflammation increased, with a rise of tension, so that the eye had to be enucleated. Microscopic examination of the tumor showed it to be composed of tubes of epithelial cells, ten to fifteen layers deep. The posterior epithelium was practically intact. The microscopic diagnosis was definitely epithelioma of the iris, in spite of the fact that the tumor was on the anterior surface. It might possibly have originated from an aberrant cell-rest of ciliary epithelium according to the hypothesis of Mawas.

A second patient, aged thirty-four years, had an iritis in the left eye. There was a yellowish-white mass covered with vessels in the lower portion of the iris. At the same time the patient had a hepatitis. The mass resembled a sarcoma but the visual acuity was normal and the presence of the hepatitis made one think of the possibility of granuloma. There was a slight hypotony and the globe was tender. The Wassermann was positive and the growth disappeared under specific treatment.

A man forty years old had seen a small mass appear at the inferior portion of the iris. It projected into the anterior chamber at the root of the iris and did not extend to the periphery. Nothing was seen with the ophthalmoscope in the ciliary region and the vision was normal. After enucleation a leucosarcoma of the ciliary body was found which had destroyed the root of the iris and invaded the anterior chamber. *M. F. Weymann.*

16. INJURIES

Achermann, E. **Keratoiritis from squill dust.** Klin. M. f. Augenh., 1928, v. 81, Aug.-Sept., pp. 196-199.

A youth of seventeen years was for about a week occupied in crushing squill seeds in a mortar From the first day he suffered from violent coryza and noticed rainbow colors around lights. On the sixth day lacrimation, photophobia, and pain in the eyes prevented continuance of the work. He presented conjunctivitis, keratitis, opacity of the posterior surface of the cornea, and iritis, which healed under dionin treatment. Experiments with squill dust on three rabbits showed similar conditions clinically and anatomically.

C. Zimmermann.

Bücklers, Max. **Experimental and histological observations on the influence of highly concentrated ultraviolet rays on rabbit eyes.** Graefe's Arch., 1928, v. 121, p. 73.

The author's researches demonstrated that isolated ultraviolet rays of from 400 to 285 μμ, even in the most highly concentrated form, produced only transient and superficial injuries to the eye. Burning of the anterior part of the eye was produced only by the highest concentration of the collective radiating energy of the mercury vapor lamp, in which we have not only the ultraviolet in enormously increased intensity but also the visible rays as far as into the ultrared. No opacity of the lens was produced by even unusually high concentrations of ultraviolet rays alone, whereas lenticular changes were comparatively easily caused by the short-wave ultrared rays. *H. D. Lamb.*

Chronis, Panos. **Injury of the eye by a pepper seed, followed by tetanus and death.** Klin. M. f. Augenh., 1928, v. 81, Oct., pp. 509-510.

The right eye of a man aged eighteen years was shot with a rifle

loaded with pepper seed, from a distance of five meters. The anterior chamber was filled with blood, and through a perforation at the sclerocorneal junction a pepper seed was extracted. After two days panophthalmitis and tetanus resulted. The eye was exenterated and tetanus antitoxin was injected into the opening but the patient died on the fifth day. The author raises the question whether antitoxin ought to have been injected immediately after the injury.

C. Zimmermann.

Cross, George H. **Removal of a number six lead shot from within the eyeball by specially devised forceps with the aid of the double plane fluoroscope.** Trans. Amer. Ophth. Soc., 1927, v. 25, April, p. 80.

The pellet of shot passed through the upper eyelid of his remaining eye on a downward course and entered the sclera, about 8 mm. above the limbus, lodging in the vitreous chamber about 12 to 15 mm. back, 6 mm. to the temporal side of and 8 mm. below the axis. It was impossible to see the shot with the ophthalmoscope. The right eye had been enucleated twenty-five years previously. The successful instrument was a pair of cross-action forceps made of no. 18 German silver wire, with the ends flattened and bent in the form of a circle and filed out to fit a number six lead shot.

The patient was placed on the fluoroscopic table so that the two beams of light would cross at the position of the foreign body. An opening was made in the eyeball and the forceps introduced and turned at right angles so that their action would be in line with the incision, while the tips were placed over the approximate position of the lead shot as located on the x-ray film. The speculum was then removed, all lights turned out, except for the slight reflection from the fluoroscope. The roentgenologist directed the location of the tips of the forceps. When the forceps were in alignment with the shot they were released and grasped the shot, which was removed without loss of vitreous or serious damage to the eye.

John A. McCaw.

Elschnig, A. **Scleral window for exposing the uvea.** Klin. M. f. Augenh., 1928, v. 81, Nov., pp. 654-657. (One illustration.)

Instead of meridional incision of the sclera, Elschnig recommends a rectangular flap from three to five millimeters wide and sutures of the sclera, to avoid difficulty in exact localization and undesirable contusion of the choroid during removal of a foreign body.

C. Zimmermann.

Kalt, M. E. **Direct wound of optic papilla by breaking of glasses.** Ann. d'Ocul., 1928, v. 165, Dec., pp. 892-897.

A fragment of a lens penetrated a boy's eye. Iridocyclitis ensued and enucleation was necessary. Sections showed a conical elevation of the temporal border of the disc. Under the nerve layers there was a serous detachment of the retina. The picture was attributed to infection with erosion of a vessel at the temporal side of the disc. *Lawrence Post.*

Leonardi, E. **The extraction of endobulbar particles of metal by the aid of the Mellinger magnet.** Ann. di Ottal., 1928, v. 56, Dec., p. 1096.

In twenty-one cases recorded the metal was extracted by means of the inner-pole Mellinger magnet, which notwithstanding its great advantages is rarely employed in ophthalmic clinics. There are but two in Italy, one at Padua and one at Palermo. The head of the patient is placed in a solenoid so that the injured eye becomes the center of a magnetic field. When the current passes, the foreign body if magnetic becomes itself a magnet. If then a bar of soft iron is placed within the magnetic circuit the lines of magnetic force become almost directly parallel, permitting far more delicate manipulations than are possible with Haab's giant magnet. (See

description of Mellinger's magnet, vol. 6 of American Encyclopedia of Ophthalmology.) The author by preference used the scleral route when the fragment was deeply imbedded and the lens uninjured, considering that vision of 1/10 through the crystalline lens was of more practical value than 10/10 in an aphakic eye.

Park Lewis.

Meesmann, A. **Contribution to lesions of the human lens by roentgen and radium radiation.** Klin. M. f. Augenh., 1928, v. 81, Aug.-Sept., pp. 254-259. (3 ill.)

One case treated with roentgen rays and one with radium show that roentgen or radium cataract commences exactly at the posterior pole of the lens, independent of the place where the hyaloid canal begins. The localization cannot be explained by direct action of the rays, but is to be considered as an indirect lesion, like the equally well localized and similar polar opacity from ultrared rays. The very fine subcapsular vacuoles (myelin drops?) and the fine diffuse opacities of the superficial parts of the lens are also to be interpreted as indirect lesions. After more intense doses (radium cataract) the lens capsule, epithelium, and superficial cortex may be damaged, these lesions showing by their localization direct dependence upon the radiant energy.

Of thirty-four cases which had all been treated with Finsen light without damage, sixteen were also exposed to the Kromayer quartz lamp without harm to the lens.

C. Zimmermann.

Meyerbach, Fritz. **Corodenin as protection against ultraviolet rays.** Klin. M. f. Augenh., 1928, v. 81, Oct., pp. 456-471. (4 tables.)

In his tests with different sources of light rich in violet rays, Meyerbach found a protective action of corodenin against arc lamps and electric welding. It has rather a technical than a medical indication.

C. Zimmermann.

Nida, M., and Chiazzaro, D. **Infection of crystalline lens by bacillus megotherium.** Annal. d'Ocul., 1928, v. 165, Dec., pp. 909-914.

This was a case of infection from a foreign body which penetrated the lens. A detailed description of the cultural characteristics is given, with illustrations of the organism. The culture was obtained after enucleation, which was necessitated by pain after vision had been lost.

Lawrence Post.

Paderstein. **Limitations as to demonstration of iron splinters in the eye.** Klin. M. f. Augenh., 1928, v. 81, Nov., pp. 686-688.

A patient aged eighteen years stated that five weeks previously a piece of steel had flown into his right eye, and had been removed A few days ago he had noticed that he could not see with this eye. The eye was without irritation but showed mature cataract and a fissure of the anterior capsule, without scar of cornea, sclera, or iris. Sideroscope, roentgen rays, and giant magnet gave no evidence of a foreign body. After absorption of the greater part of the lens following discission, a black particle was noticed on a remnant of lens matter. The sideroscope brought close to the eye gave a strong reaction, but roentgenography was negative. The steel was removed. It was one millimeter long, 0.2 millimeter broad, and weighed 0.02 milligram. Thus the distance was the reason for the insufficiency of the sideroscope at the first examination.

C. Zimmermann.

Parlange, J. A. **The ocular sequelæ of war gases.** Arch. d'Opht., 1929, v. 46, Feb., p. 87.

A very thorough review of reports of injuries caused by war gas, particularly yperite, is given. As doubtful ocular sequelæ are reported cases of optic atrophy, hemeralopia, vascular thrombosis and embolism, and glaucoma. As true ocular sequelæ are reported of three ulcerations in 1500

gassed individuals, two cases of corneal opacity in 1800 gassed individuals, and 700 conjunctivitides or burns among 4000 gassed individuals. The pulmonary complications of gas are ten to twelve times more numerous than the true ocular complications. The ocular sequelæ are divided into two groups, the first the nonspecific cicatricial complications and the second a specific appearance of the eyes following gassing with yperite, called by the writer the conjunctivolimbic syndrome. In the cicatricial group one finds exclusively the lids, conjunctiva, cornea affected. The yperite causes burns with the formation of cicatrices, but one finds very few severe cicatricial sequelæ. This may be explained by the fact that those who received enough gas to get severely burned about the eyes also developed pulmonary complications with a fatal result. Those individuals with some previous eye condition such as trachoma, keratitis, or old corneal scar suffered more severely from being gassed. The scarring affect upon the cornea was due both to chemical action and secondary infection. Yperite has a predilection for mucous membranes and its action with a latent period may be due to the time it takes for hydrolysis into hydrochloric acid. In addition to the cicatricial group there is a second group whose eyes are sensitive to light and wind since the gassing. They have repeated attacks of conjunctivitis. The bulbar conjunctiva appears white like porcelain and the vessels are quite visible and of a red carmine color. Above and below at the limbus there is an invasion of the cornea by lines of parallel vessels ending in loops. These limbal areas show hypesthesia. Experimental work on rabbits showed that a similar appearance could be produced by chloroform burns. In these eyes the ciliary nerves were not affected so that the hypesthesia must be due to diminished nutrition. The finer observations on the vessels were made with the slit-lamp and numeruos drawings accompany the article. The treatment is to keep the individual out of irritating environments and to use zinc-adrenalin collyria as palliatives, but the condition seems incurable. *M. F. Weymann.*

Rohrschneider, W. **Genesis and morphology of roentgen ray cataract.** Klin. M. f. Augenh., 1928, v. 81, Aug.-Sept., pp. 254-259. (3 ill.)

Five years after roentgen radiation of the cheek for fibroma of the nasopharynx in a shoemaker aged twenty-three years, opacities of both lenses developed resembling glass blower's cataract, although the eyes had been protected by lead. It had been observed that after termination of the radiation treatment the skin of the eyelids had become brown, without loss of hair. The ocular conjunctiva in its nasal portion opposite the palpebral fissure showed ectasias and constrictions of the bloodvessels like strings of beads, as described by Birch-Hirschfeld as characteristic of alterations caused by roentgen rays. The lenticular changes consisted in reticular opacities of the whole posterior surface of the lens and whitish posterior polar cataract.

C. Zimmermann.

Sattler, C. H. **Transient visual disturbances after light baths to the head.** Klin. M. f. Augenh., 1928, v. 81, Aug.-Sept., p. 185.

After a light bath to the head the patient complained of seeing a veil before his eyes Ophthalmoscopically dark lines, partly concentric with the corneal margin, partly radial, were visible in the pupillary area, and the slit-lamp showed folds of the posterior layers of the cornea. They disappeared after three-quarters of an hour, and vision became normal. The trouble was caused by indentation of the cornea by the leather shields fastened on the eyes for protection from the light. *C. Zimmermann.*

Wieser, S. **Direct roentgen skiagraphy of the anterior segment of the globe, Vogt's method.** Klin. M. f.

Augenh., 1928, v. 81, Aug.-Sept., pp. 234-253. (4 ill. and 1 table.)

Small pieces of metal and chips of glass, china, and stone, in consequence of their slight penetrating power, frequently are lodged in tough tissue of the sclera, in the ciliary body, or in the angle of the anterior chamber, and by their small size or substance are invisible in the ordinary roentgen picture. Such overlooked foreign bodies may lead to loss of the eye and, as shown in a case, after years to sympathetic ophthalmia. Hence in suspected intraocular foreign bodies, also after negative magnet tests, direct skiagraphy according to Vogt is indispensable. For suspected pieces of glass, china, or stone it is the only useful method. It allows localization of the foreign body to fractions of a millimeter. The method is described and illustrated in detail, with report of five cases. *C. Zimmermann.*

17. SYSTEMIC DISEASES, INCLUDING PARASITES

Archangelsky, W. N. **Subretinal aspergillus fumigatus simulating cysticercus.** Klin. M. f. Augenh., 1928. v. 81, Aug.-Sept., pp. 211-218. (10 ill.)

A peasant aged forty-two years had noticed two months previously impairment of vision of the right eye. The posterior portion of the vitreous showed opacities. The disc was ill defined, the surrounding retina edematous. Downward and to the temporal side was a prominent oval vesicle, over which the retinal vessels coursed. In its center a white point appeared transiently. Vision was absent. All attempts at removal of the supposed subretinal cysticercus failed, and the eye had to be enucleated. The anatomical changes were: a subretinal suppurative focus with conglomerates of aspergillus fumigatus, isolated accumulations of leucocytes with mycelia in the vitreous, old granuloma of the iris, chronic proliferating choroiditis. The origin of the metastasis could not be found.

C. Zimmermann.

Giannantoni, A. **The blood groups in relation to certain eye diseases.** Ann. di Ottal., 1928, v. 56, Aug., p. 673.

The first part of this article is devoted to an exposition of the methods employed in determining the four blood groups and the relative proportions of each of these. The second part is devoted to the examination and assignment of those having certain eye diseases to the different groups. The studies of various authors have suggested a predisposition on the part of those in one or the other of these groups to special diseases. The author's investigations were made with a view of determining whether this is true of diseases of the eye. The author thinks it probable that there is a relationship between the blood chemistry and cataract, which was found to prevail most largely in group one, and much less frequently in group two. In trachoma the greater proportion was in group two and very few in group one. Glaucoma was mostly found in group two. In group one, less than the normal ratio of myopia was present. Hypermetropia was most frequently represented in group two. The number of cases examined was not sufficient to make the results conclusive. *Park Lewis.*

Magnasco, M. **Ocular affections of dental origin.** Riv. Oto-Neuro-Oft., 1928, v. 5, May-June, pp. 254-269.

The author gives a full description of the bony, vascular, and nervous connections between the eye and the teeth. He divides the related ocular affections into two classes: (1) eye affections by continuity, including perisaccular abscesses, maxillary sinusitis, and secondary orbital cellulitis, and others; and (2) distant eye affections and complications, which he classifies as anatomic, functional and motor. Among the anatomic he considers ulcerous keratitis as a reflex condition due to irritation of the fifth cranial nerve, herpetiform keratitis as a result of disturbed trophic conditions

of the tissues supplied by the fifth nerve and the sympathetic and various affections of the uveal tract which have been found connected with periapical abscesses. Among the functional he considers reflex lacrimation and facial neuralgia. Among the motor disturbances he mentions blepharospasm, the mydriasis associated with paresis of accommodation, and the miosis associated with spasm of accommodation. A dental cause may be admitted when other important etiologic factors are excluded, and especially if an apical or periapical focus of infection of the superior maxillary bone is present. (Bibliography.) *M. Lombardo.*

Natale, Amadeo. **Two hydatid cysts of the orbit.** Arch. de Oft. de Buenos Aires, 1918, v. 3, Oct., p. 620.

Hydatid cysts of the orbit appear rather frequently in South America. The first case here reported was that of a woman, thirty years old, who presented a marked exophthalmos of the right eye, the globe being displaced forward, downward and slightly outward, and remaining immovably fixed in that position. Palpation showed a hard tumor between the orbital margin and the eye. There was no fluctuation, nor was the mass reducible by pressure. The ophthalmoscope showed an optic neuritis of that side, with dilated tortuous veins, and infiltration of the nerve layer in the vicinity of the disc. Vision was reduced to one-fifth normal. A typical Krönlein operation was done, and a tumor discovered within the muscular cone, necessitating division of the external and superior recti to effectively approach it. Upon attempting to extirpate it, the thin wall broke, discharging about five c.c. of clear liquid. The cavity was cleansed with formol, the divided muscles sutured, and the skin closed with drainage. The eye recovered a fair amount of motility.

The second case was in a sixteen-year-old girl who had noticed diplopia for the preceding two years, with diminishing vision in the right eye. The cornea protruded more than two centimeters beyond the orbital margin. Between the ball and the infero-internal angle of the orbit could be felt a tumor of approximately the size of a pigeon egg. The tumor mass was but slightly reducible by pressure. No eye movements remained, and the nerve was completely atrophic. The orbit was opened through the conjunctiva above the internal canthus. The periosteum was incised, which also opened the cyst wall, causing escape of about fifteen c.c. of clear liquid. The cyst cavity was opened widely and wiped out with formol. One month later the position of the eye was normal, and its motility only slightly disturbed. *A. G. Wilde.*

Orloff, K. C. **Melitococcia (Malta fever) and the eye.** Russkii Opht. Jour., 1928, Dec., pp. 657-665.

Nineteen guinea-pigs infected with melitococcia presented on clinical and microscopic examination various lesions of the eye: deep keratitis, uveitis, neuroretinitis, and complicated cataract. Two histologic types of inflammation were found in the structures of the eye: a diffuse infiltration, and granulomatous foci, the latter closely resembling tubercles with the exception that there was no tendency to caseous degeneration.

M. Beigelman.

Scalzitti, G. **Specific therapy in luetic ocular affections.** Ann. di Ottal., 1928, v. 56, June, pp. 481-503.

Fourteen cases, including cases of interstitial keratitis, paresis of the internal rectus, paresis of the external rectus, monocular ophthalmoplegia, and neuroretinitis, were treated with insoluble salts of bismuth, or mercury and bismuth salts, or mercury and arsenobenzol, or bismuth and arsenobenzol. The following results were obtained: In interstitial keratitis the bismuth salts acted better than mercury and arsenobenzol. In paretic lesions mercury and arsenobenzol gave better results than bismuth. Bismuth, bismuth and mercury, and bismuth

and arsenobenzol all gave good results in neuroretinitis. (Extensive bibliography.) *M. Lombardo.*

Worms, G. and Sourdille, G. **Ocular complications of gastrointestinal pathology due to specific organisms.** Arch. d'Opht., 1928, v. 45, Dec., p. 737.

A review of the literature upon ocular infections secondary to enteritis is given. Histories of three individuals in whom iridocyclitis appeared to be secondary to colon bacillus infection are related. The enterococcus was blamed for certain conjunctival infections following an enterorenal syndrome. The major portion of the article is devoted to a report of twelve cases of iritis and scleroconjunctivitis in patients following an enteritis due to dysentery bacilli. The agglutination test showed positive results in all cases except one with the bacillus of Hiss. In this one case both the Hiss and the Shiga gave positive results. *M. F. Weymann.*

18. HYGIENE, SOCIOLOGY, EDUCATION, AND HISTORY

Baquis, E. **Reflections on existing indemnity laws and their application.** Ann. di Ottal., 1928, v. 56, July, p. 590.

After discussing the social and economical aspects of indemnity for injuries Baquis urges that prevention is often practicable. Show the operator before he enters on his work the care required in manipulating dangerous machines and impress on him the loss which blindness or partial sight entails. What should be the responsibility when previous injuries have already lowered the visual acuity? In high myopia the detached retina will occur from a blow so slight that it would have left a sound eye unhurt. In many cases permanent defects have already existed before the injury occurred. The added vulnerability of the cornea to a slight scratch must be considered when chronic dacryocystitis is present.
Park Lewis.

Gabrielidés, A. **Optotypes of Galen.** Arch. d'Opht., 1929, v. 46, Feb., p. 84.

According to Pergens the first optotypes for measuring visual acuity were designed by Kühler in 1835, Tauber in 1816, and de Valdes in 1623. In the works of Galen is a passage which states that a person with very acute vision could read the letters of the manuscript at a distance of four cubits. Not having the original manuscript at hand, the writer calculated that an emmetrope of the present day should read characters with a height of two mm. at this distance of four cubits. Today we consider the reading of letters seven mm. high at five meters as normal vision. According to Galen's measurements one could read letters six mm. high at five meters distance, which the average person can do today. Upon the basis of Galen's measurements the writer constructed a chart of Galen to add to our collection of early optotypes.
M. F. Weymann.

Mann, Ida, and James, R. R. **Communications; John De Peckham.** Brit. Jour. Ophth., 1929, v. 13, Feb., p. 49.

The subject of this memoir has been claimed by many to be the first English author of a work on optics and as the discoverer of concave lenses. His work has been somewhat overshadowed by that of his contemporary, Roger Bacon. Some authorities find a list of fifty-six works, mostly devoted to ecclesiastical subjects. Three, however, were purely scientific, and one of these, "Perspectiva communis", is said to be the first text book on optics of English authorship, and was used as an authority well into the sixteenth century. The first part deals with the nature of light, its propagation in straight lines, the structure of the eye, and the nature of vision. The portions dealing with the anatomy of the eye are crude, the lens being shown as in all the Arabian diagrams, in the center or towards the back of the vitreous. The second and third parts of the book deal with the laws of reflection and refraction respectively. Plane

and curved surfaces are considered, and in the third section apparently occurs the famous mention of concave refracting surfaces, beginning "Concavitate diaphani densioris ad oculum versa accidit converso illi quod contingit conversa ad oculum convexitate". *D. F. Harbridge.*

Mura, F. **Trachoma in the province of Caligari.** Rev. Internat. du Trachôme, 1928, v. 5, July, p. 107.

Mura finds that in 1926 five and three-tenths percent of the population of the province suffered from trachoma, while in 1914 the percentage was two and one-half. It is most frequent in women (sixty percent), and most common between the ages of one month and six years, although generally prevalent up to the age of thirty. It is concluded that the widespread distribution of the disease is due to the ignorance of the people and the very low standards of living. Indirectly, the prevalence of tuberculosis and malaria also contribute. The effect of altitude (one to 700 meters) is not clear, although trachoma is most prevalent at sea level. Mura recommends hospitalization of all trachomatous patients, the establishment of dispensaries in every township where trachoma exceeds five percent, and mountain and marine colonies.

George H. Stine.

Worms, G., and Beyne, J. **Nocturnal vision, its elements of appreciation in man, and its importance in the aviator.** Bull. Sec. Franç. d'Opht. 1928, p. 83.

Worms and Beyne divide nocturnal vision into its two elements, light sense and form sense. The first has been repeatedly shown to be maximal outside the fovea, while the authors show the latter to be maximal in the the fovea. In measurements of normal subjects, the nocturnal visual acuity was found to vary as much as thirty-three degrees, bearing no relation to the daylight value. In ametropes, the acuity was usually deficient, particularly in hyperopes and astigmatics. The importance of good night vision in aviators is discussed and the testing of these for acuity and rapidity of adaptation is urged.

Phillips Thygeson.

NEWS ITEMS

News items in this issue were received from Drs. Hans Barkan, San Francisco; C. A. Clapp, Baltimore; J. M. Patton, Omaha; G. Oram Ring, Philadelphia, and G. M. Van Poole, Honolulu. News items should reach **Dr. Melville Black,** Metropolitan building, Denver, by the twelfth of the month.

Deaths

Dr. John Hemsath, Newark, New Jersey, aged fifty-seven years, died February twentieth of pneumonia.

Dr. Robert Vance Brawley, Salisbury, North Carolina, aged fifty years, died January fifth of pneumonia.

Dr. James Moores Ball, Saint Louis, aged sixty-six years, died March first, of heart disease. (See obituary, p. 424.)

Dr. Thomas H. Fenton, Philadelphia, aged seventy-two years, died February twenty-third, at Atlantic City, New Jersey.

Dr. F. D. Boyd, Forth Worth, Texas, aged sixty-one years, died January fourth of myocarditis and influenza.

Dr. Francis Allan Hamlin, Bakersfield, California, died February first, of carcinoma of the prostate.

Jules Badal, founder of the school of ophthalmology at Bordeaux, recently died, aged eighty-nine years. He earned the cross of the Legion of Honor for his behavior at a Parisian hospital during the siege of 1870. He was one of the directors of the Archives d'Ophtalmologie up to the time of his death.

Miscellaneous

The University of Kansas school of medicine and the extension division of the university will give a course for general practitioners in eye, ear, nose, and throat. The date has not been announced.

Those intending to submit applications to the American Board for Ophthalmic Examinations are again reminded that the Board will hold an examination on July eighth at Portland, Oregon, in connection with the meeting of the American Medical Associ-

ation, and on October twenty first at Philadelphia, just before the meeting of the American Academy of Ophthalmology and Otolaryngology at Atlantic City.

La Clinique Ophtalmologique, French eye journal founded by Jocqs and Darier thirty-two years ago, has suspended publication for this year, on account of difficulties which have arisen since the death of A. Darier in 1927 and the recent death of G. Gérard.

Dr. Katsusaburo Yamagiwa, pathologist of the University of Tokyo, has been awarded the Nordhoff-Jung prize for the best work of recent years in the investigation of the cancer problem. Yamagiwa and his collaborators invented and developed a technique for producing with almost absolute certainty experimental cancer in animals.

An article entitled "Are retail prices for glasses too high?", by Joseph S. Halpert in Guildcraft (the organ of the Guild of Prescription Opticians of America) for March, 1929, emphasizes the very great number of opticians' adjustments for which no charge is made, although they represent a very large percentage of the total overhead expense.

A postgraduate course in ear, nose, and throat surgery will be given for American physicians at the University of Bordeaux, France, commencing July 22, 1929. Dr. Leon Felderman, Philadelphia, is in charge of registration for this course.

At the annual dinner of past and present students of the Royal London Ophthalmic (Moorfields) Hospital on February 7, 1929, it was announced that the admission of new students had created a record, reaching the number of 134. The staff of lecturers had been strengthened by the addition of Miss Ida Mann and Mr. Duke Elder in the departments of embryology and physiotherapy respectively.

The nineteenth annual meeting of the Oxford Ophthalmological Congress will be held at Keble College, Oxford, on July 3, 4, 5, and 6. The program will include a discussion on diseases of the lacrimal apparatus, introduced from the ophthalmological standpoint by Dr. Joseph Meller of Vienna, and from the rhinological standpoint by Dr. J. S. Fraser of Edinburgh. Miss Ida Mann will deliver the Doyne memorial lecture, her subject being the vascularization of the vertebrate eye. The program will also include a discussion on ocular manifestations of skull fractures, and papers by Ernest Maddox, Thomson Henderson, N. C. Ridley, Bernard Samuels, Nicholas Hughes, and George Young. Accommodation for those attending the congress is available in Keble college itself, at very moderate charges. The usual formal and informal evening dinners will be arranged in the hall of the college. Ophthalmologists may obtain membership in the congress (entrance fee one guinea, plus a contribution of one guinea for each occasion—presumably each annual meeting—on which a member attends the congress) by application to the secretary, C. G. Russ Wood, 12 St. John's Hill, Shrewsbury, England.

Dr. Adalbert Fuchs sends announcement of the postgraduate course in ophthalmology, to be given in Vienna in the last quarter of 1929. The program includes special lectures by Ernst Fuchs; an operative course by J. Meller; courses in bacteriology and refraction by K. Lindner; a course on industrial compensation and simulation by H. Lauber; courses in histology, pathology, fundus diseases, examination, and the history of ophthalmology by A. Fuchs; courses in neurology, muscles, and visual fields by E. Bachstez; courses on external diseases, anatomy of the orbit, ophthalmoscopy, operations, and photography of the fundus by G. Guist; courses in ophthalmoscopy by K. Safar; courses in the slit-lamp and physiology by P. Kronfeld; courses in therapy and external diseases by L. Sallmann; and courses in external diseases, comparative ophthalmology, roentgen rays, hypophysis and sinuses, West operation, radium treatment, practical skiascopy, and embryology of the eye by F. Fischer, Kolmer, A. Schüller, O. Hirsch, K. Kofler, A. Fuchs, F. Subal, and G. Pollitzer respectively. Seven new slit-lamps have been added for the course, so that for every two members of the course a slit-lamp will be available. The address of the secretary, Dozent A. Fuchs, is Vienna VIII/2 Skodagasse 13. The entire course is given in English for a minimum of ten and a maximum of sixteen men. The fee is $244.00. Application with certified check for $50.00 should be sent to the secretary. Applications are accepted in order of priority.

The committee on arrangements announces that the Colorado Congress of Ophthalmology and Otolaryngology and the seventh annual summer graduate course will be held this year from June 17 to 29 inclusive, the last two days being given over to the Congress for the presentation of papers. The time selected is one month earlier than usual, and immediately precedes the meeting of the Pacific Coast Oto-ophthalmological Society at Salt Lake City, July 1 to 3, the meeting of the American Laryngological, Rhinological and Otological Society at San Francisco, July 4 and 5, and the meeting of the American Medical Association at Portland, July 8 to 12. Special courses in Denver are promised by Dr. Joseph C. Beck of Chicago, Dr. Arthur C. Bedell of Albany, Dr. E. C. Ellett of Memphis, Dr. William B. Mullin of Cleveland, Dr. Gordon B. New of Rochester, Dr. H. P. Wagener of Rochester, and Dr. Clifford Walker of Los Angeles. The class for the summer graduate course is limited to sixty-five members, and will, as usual, be divided into small sections for the demonstrations and clinics. Dr. H. L. Whitaker, Republic building, Denver, is again secretary-treasurer for the course.

Dr. Wherry writes that the Union Pacific Railroad is arranging for a special otolaryngological train to accommodate those attending the meetings on the Pacific coast during July. This train will leave Chicago Sunday, June thirtieth, for the meeting of the Pacific Coast Oto-ophthalmological Society in Salt Lake City on July second, and will leave Salt Lake City the night of July second to reach San Francisco the night of July third, for the "Triological" meeting. It will again leave for Portland the afternoon of July sixth, to reach that city on Sunday afternoon, July seventh. Inquiries should be addressed to Dr. W. P. Wherry, 1500 Medical Arts building, Omaha, Nebraska, who has been asked to represent the two societies who are sponsoring the special train, namely the Laryngological, Rhinological, and Otological Society, and the Pacific Coast Oto-ophthalmological Society.

Personals

Dr. W. A. Shoemaker of Saint Louis has been spending a vacation in Hawaii.

Dr. W. H. Wilder of Chicago has also been enjoying a few weeks rest in Honolulu.

Dr. Harold F. McDuffie has been elected president of the Academy of Ophthalmology and Otolaryngology of Atlanta, Georgia, for the ensuing year.

Dr. Emmette T. Gatewood has been elected president of the Ophthalmological and Otolaryngological Society of Richmond, Virginia, for the ensuing year.

Drs. Harry W. Woodruff, Joliet, and William F. Moncrieff, Chicago, discussed strabismus before the Chicago Ophthalmological Society on March eighteenth.

Dr. Hans Barkan, San Francisco, left in April for six months in Europe. While there he will attend the International Ophthalmological Congress at Amsterdam.

Dr. Harry S. Gradle of Chicago addressed the Harlem Medical Association, February twenty-sixth, on "Tuberculosis of the eye in relation to heterochromia iridis and cataract".

Dr. Carl Koller, now of New York, has been awarded the Kussmaul medal, by the faculty of Heidelberg university, for his original work in Vienna in 1884 on the discovery of cocaine anesthesia in ophthalmology. Dr. Koller recently celebrated his seventieth birthday.

Among those visiting the Wilmer Institute during the last few weeks have been Dr. Lang of Munich, Dr. Eugene Chan of Hong Kong, Drs. Ben Witt Key and Arnold Knapp of New York, Dr. Gerald Gray of Pasadena, and Dr. Gunderson of Boston.

Dr. Luther C. Peter of Philadelphia was the guest of honor at the March meeting of the ophthalmic section of the Toronto Academy, and discussed the subject of "Methods and results in perimetry".

A recent picture postcard from M. Goldenburg of Chicago describes him as "flirting with the mummies, obelisks, and cuneiform inscriptions on stone of ancient civilizations". That is to say he has been traveling in Egypt.

Dr. William Zentmayer of Philadelphia opened the discussion of Dr. Walter Parker's paper on "The management of chronic simple glaucoma", read before the meeting of the section on ophthalmology of the New York Academy of Medicine, on March eighteenth.

Dr. Allen Greenwood of Boston was the guest of the Kansas City Eye, Ear, Nose, and Throat Society at their meeting on March twenty-first. Dr. Greenwood conducted a "dry clinic" in the forenoon and in the afternoon gave an operative clinic illustrating procedures indicated in the operative treatment of glaucoma.

The program of the section on ophthalmology of the College of Physicians of Philadelphia, on April eighteenth, was participated in by Drs. L. F. Appleman, B. F. Baer, F. H. Adler, I. S. Tassman, W. G. Karr, A. Cowan, M. E. Marcove, and J. I. Gouterman.

The Milwaukee Oto-ophthalmic Society was addressed February nineteenth by Dr. Peter Kronfeld, Chicago, on the diagnosis of glaucoma.

Dr. John F. Dickson, Portland, has been appointed emeritus professor of ophthalmology in the University of Oregon school of medicine.

Dr. Frederick A. Kiehle has been appointed professor of ophthalmology and head of the department in the University of Oregon school of medicine.

Dr. Joseph A. Stucky of Lexington, Kentucky, addressed the Tennessee state medical society at Jackson, Tennessee, April ninth to eleventh, on "Responsibility of ophthalmologists and otolaryngologists for the conservation of health".

Dr. Edward Jackson of Denver has presented to the Denver Home for the Adult Blind a twenty-one volume Bible of revised Braille in international script. The scriptures are in French, Spanish, and English.